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THE SWING. *Frontispiece.*

WILLIAM GAY;

OR,

PLAY FOR BOYS.

BY JACOB ABBOTT.

IN FOUR VOLUMES.

ILLUSTRATED BY H. W. HERRICK.

PLAY FOR SUMMER.

NEW YORK:
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1869.

THE WILLIAM GAY SERIES.

I. PLAY FOR WINTER.

II. PLAY FOR SPRING.

III. PLAY FOR SUMMER.

IV. PLAY FOR AUTUMN.

4 Volumes. 16mo.

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WILLIAM GAY'S PLAY IN SUMMER.

CHAPTER I.

A LITTLE LATIN.

Watt Remsen, one of the young men who lived on William Gay's father's farm, and had charge of all the nice and difficult work there, was possessed of quite a scientific taste, — that is, he liked to look into the principles of things, and to understand the why and the wherefore of the different processes that he performed in his work, and of the various phenomena that he witnessed.

He spent his evenings chiefly in reading scientific books. William used to look into his books sometimes, but he could not understand them, they were so full of hard words; and instead of pictures there were curious shaped figures formed of circles and straight lines, with letters printed at the ends of the lines and at the corners.

When William asked Watt questions, Watt often answered him in learned language, which William could not understand at first, — but when Watt explained it to him more fully, he generally understood it very well.

Up in the garret of the house where William lived was an old baby wagon, which had been used for drawing William about when he was very small, and afterward for other children. When, at length, there were no longer any children to be drawn in it, it had been used for a long time as an errand cart, to go to the village to bring home parcels and packages of things purchased at the stores, and to convey articles of any kind about the town, whenever Mrs. Gay had occasion for such a service.

There was a rule made that William, when using the wagon for this purpose, was not to allow any boy to get into it nor to get into it himself, — but he might let other boys help him draw it; and sometimes, when the wagon was empty, two or three boys would take hold of the handle and run along the road with it, or down a

long hill, at the top of their speed, for the pleasure of hearing it rattle over the ground behind them.

Now, a wheel is made with a hub in the centre, and spokes leading from the centre out to the circumference, where there is a wooden rim bound with an iron band. The reason why a wheel is made of open work in this way is that it may be light. The hub is made large so as to hold the ends of the spokes firmly; and the band on the outside, which is called the *tire*, is to prevent the stones and gravel of the road from indenting the wooden rim of the wheel, and so wearing it soon away.

The tires of large wheels are usually made fast by being *shrunk on*, as they call it. This is the way they do it. They first heat the tire by a round fire, made usually by the side of the road in front of the shop of the blacksmith who is doing the work. They make the iron rim a little too small, in the first instance, to go over the wheel; but heating it swells it so that it becomes large enough to go on. When it is ready, three or four workmen standing all around it take it up, by means of blacksmiths'

tongs, which are so made as to take hold of things with a tremendously tight grip, and put it over the wheel.

You can have tongs made so as to open wide, and take up large things, but only hold them rather loosely; or, so as not to open wide, and take up small things, but to hold them very tight. Tongs for common fires are made to open wide, and hold things rather loosely, — for sometimes the sticks of wood on the fire are pretty large, and it is not necessary to hold them in a very hard grip. But blacksmiths' tongs need not open very wide, as it is only comparatively small pieces of iron that they have to grasp, — but then they must hold them with great force to prevent their being knocked out of place when the workman is hammering them on the anvil.

If a boy holds a small stick in a pair of common fire tongs, another boy could pull it away very easily. But if it is held in a pair of blacksmith's tongs, he could not possibly pull it away.

The next time you see a pair of blacksmith's tongs examine them carefully to see how they are made, so as to work as they do, and hold with such a tight grip.

But to come back to the wagon. When the hot tire is put on by the men over the wooden rim of the wheel, it immediately begins to burn the wood, but the men pour on water all around, as soon as they are sure that it is in its place; and then the iron, in cooling, shrinks and binds the wood very tight, and not only holds itself on very securely, but binds all the parts of the wheel together with great force.

The wheels of baby wagons are not made in this way. The tires are put on over the rim *cold*, and are fastened in their places by small nails. They are not so strong when made in this way; and if boys run with them over the stones and gravel, the rims or tires often work loose, and even come off entirely.

This was the case with Mrs. Gay's baby wagon. The tires did not come off entirely, but they worked loose, so that sometimes when William was going along the road with the wagon, one of the tires would slip out of its place, half of it going off the rim on one side and half on the other, and then William would have to stop and knock it back again with a stone.

As to taking it to the shop when he got home, and then after putting the tire carefully in its place, securing it there with nails, such as had been used before, William never thought of such a thing.

The difficulty about the tire might have been easily remedied in this way, but there was another difficulty which was much more serious. The ends of the axle wore the wood away in the hole through the hub, made for them to turn in, and then, after a while, the holes became so large, and the axle so loose in them, that the wheels wabbled about when the carriage was drawn along, so that the boys in the town laughed at it whenever they saw it coming, and hooted at it, telling William that his wagon staggered like a drunken man.

The consequence was that William was ashamed to be seen drawing such a rickety vehicle, and so the wagon was sent up into the garret, and there it remained for several years, until William found it there one rainy day, and brought it down.

The reason why he brought it down was that Watt lived at the house now, and he thought that Watt could mend the wagon for him.

He first, however, took it to his mother and asked her if he might have it.

"What are you going to do with it?" asked his mother.

"I am going to take it to the shop and get Watt to show me how to mend it up," said William. "And then when the wheels are mended, I am going to get Watt to make a gig seat for it instead of the old basket top, which is all worn out, and then Mary can sit in it, and I can give her some rides."

"Very well," said his mother. "You may do anything with it you please that Watt approves of."

Mary, who was with William in the garret when he found the wagon, and helped him bring it down-stairs, and had listened to the conversation about it, was doubly pleased now when she found that the plan of renovating the wagon was to result in rides for her, and she and William together went immediately to the shop to lay the case before Mr. Remsen.

Mr. Remsen stopped from his work to examine the wagon. First he looked at the tires.

"Those tires can be secured very easily," said he. "They only require to be brought into their places and nailed. The nails must be clinched on the under side. I can do that for you very easily."

"Well," said William. "Do it now. I will get a hammer and the nails."

So William went to the bench and soon came back bringing a hammer, and with it some nails, about an inch long, of the kind called *finishing nails*. But Watt told him that those nails would not do at all.

"Why not?" asked William.

"Why, in the first place," said Watt, "they have no heads, — or scarcely any heads. Such nails as those are made for finishing work in wood, and the heads are made small so that they may be sunk into the wood, and the holes filled up with putty before the wood is painted so as to get them entirely out of sight. For these wheels we must have nails with large flat heads, to hold the iron securely. Besides, those nails are too long. They must only be long enough to go through and clinch a little on the under side. I'll go on with my work while you look out some suitable nails."

So William went to the nail box, and after some time spent in examining the different kinds of nails and applying them to the rim, to see about the size and length, he made choice at last of some carpet tacks, which Watt, when he came to see them, said would answer very well.

"But then," said Watt, "they had better be heated first, to make it sure that they will clinch well."

Most nails made in this country are cut from thin bars of iron as wide as the nails are to be long, by means of machinery. The cutting of the iron compresses it so much as to make it hard, and the nails accordingly, as they come from the machine, will break rather than bend much. But by heating them nearly or quite red hot, the iron swells and becomes comparatively soft again, and then, in clinching them, the points will bend over without breaking.

So William took six or eight of the nails, and went into the house and heated them red hot, on the shovel, in a very hot part of the kitchen fire. He then slid them down off the shovel to the hearth, and after wait-

ing until they were cool, he picked them carefully up again and brought them out to the shop.

Watt then showed him how to fit the tires exactly in their proper places on the rims of the wheels, and to nail them there; while Watt himself held a heavy hammer underneath, as each nail was driven in, in order to turn the point over and clinch it, as it came through.

When this was done, Watt said, —

"There! The tires are all right now — but as for the axle that's another thing altogether."

He then began to examine the hubs of the wheels, and found that the holes were worn so large that the axles worked very loosely in them, so that the wheels leaned away over to one side or the other to such a degree as to make the carriage look as if it was going to break down.

"Those holes are all worn out," said Watt. "They ought to have been *bushed*."

"Bushed?" repeated William.

"Yes, lined with brass or iron," said Watt. "They call putting in such a lining *bushing* it."

"Could not we bush it now?" asked William.

"Not very well," said Watt. "The hole is worn out so large and has become of such an irregular shape, that the bushing could not be made to fit very well, nor to hold in its place. The only way now for repairing these hubs is to bore the hole out true and let it remain as big as it is, and then to make a new axle to fit it. But the wagon will not draw easy, with wheels turning on such a large axe."

"Axe?" repeated William.

"Yes," replied Watt. "We call an axle an axe sometimes — for shortness."

"I am sorry," said William, "that they cannot be put in order so as to go, for I want to make a gig very much."

"Those wheels, even if they would go," said Watt, "would never do for a gig for such a boy as you to play with."

"Why such a boy as me?" asked William.

"You are too *old* and too *young* for such a pair of wheels," said Watt. "Little boys have not strength enough to go fast over the stones, but are obliged to go gently.

You are too *old* for that. Boys like you feel their strength, and must put it forth. Then you are not old enough yet to know how much wood and iron in such shapes will bear, and so to manage such a cart safely. Boys like you never know anything about the laws of the *vis viva.*"

"The *vis viva?*" repeated William. "What in the world is the *vis viva?* Is that Latin?"

"Yes," replied Watt, "it is Latin."

"Then, why do you say it in Latin?" asked William. "Why don't you tell me in English, so that I can understand?"

"There is not any English word that I know of that means exactly the same as *vis viva*," replied Watt.

"There must be words in English that are something like it," said William.

"Yes," replied Watt. "It means the smashing effect of two things striking together. That is something that boys like you never can understand. The smashing effect is always much greater than they think, — and so they are always breaking things to pieces. They knock them to-

gether, and then are surprised that they break — not having any idea how great the smashing effect of such a blow would be. That is, they don't understand the law of the *vis viva*."

CHAPTER II.

THE LAW OF THE VIS VIVA.

"If you mean the smashing, why don't you say smashing and done with it," said William to Watt in continuing their conversation, "instead of such hard Latin words that nobody can understand?"

"Because the smashing is only one of the effects, or rather forms of the effect of the *vis viva*," said Watt. "When scientific men study any principle, they study it in its general nature, which includes all the forms of it. Now there is no one name in English for the whole general principle, but only particular names for particular forms of it, and so they make a new name out of Greek or Latin."

"I wish you would explain something about it to me," said William.

"Well," said Watt, "I will suppose that two cannon balls of exactly the same size

and weight should strike against a fort, the second one going twice as swift as the other, which would smash the wall the most?"

"The second one," said William.

"And if it went exactly twice as swift, how much more would it smash it?"

"Twice as much," said William.

"No," said Watt. "There is where you don't understand the law of the *vis viva.* It would be four times as much. Twice two is four.

"However," continued Watt, "you answered one question right out of two, which was doing pretty well — considering that it was something that you had never learned.

"And if another ball is fired, just as large and just as heavy," continued Watt, "and goes against the wall three times as swift, how much smashing would it make?"

"Six times as much," said William.

William felt quite confident that he had got the right answer this time; for if a ball with twice the velocity would do four times the damage, he inferred that in the same proportion a ball with three times

the velocity would do six times the damage, and one with four times the velocity, eight times the damage, and so on.

"No," said Watt, "you are wrong there again. It would do *nine* times the damage: three times three are nine. You must multiply the number not by two but by *itself*, whatever the number may be.

"If it strikes with four times the velocity, how much would the damage be?" he asked.

"I dont know," said William.

"Sixteen times as much," said Watt. "Four times four are sixteen. You must always multiply the number by itself. That gives the square. A number multiplied by itself is called its square. So the damage done tends to be as the square of the velocity. That's the law of smashing."

"And of something else besides smashing, you said," rejoined William.

"Yes," replied Watt. "If you strike a boy twice, and the second time you strike him twice as hard as you did the first time, you hurt him, or are liable to hurt him more than twice as much. You are liable to hurt him *four times* as much."

"I think you would certainly hurt him four times as much," said William.

"No," replied Watt, "for you might strike him in a different place, or there might be some other accidental circumstance to change it. You might in fact strike him in such a way as not to hurt him at all the second time; as for instance if you were to hit him just over his pocket, and he had a book or a slate in his pocket, in which case, instead of hurting him, you would only bruise your own knuckles."

William laughed.

"Or I might perhaps break the slate," said he.

"Yes," said Watt, "and you would be four times as likely to break it if you struck twice as hard, and nine times as likely if you struck three times as hard, — I mean by that, if your fists in striking moved three times as swiftly."

"Is that the *vis viva?*" asked William.

"Not exactly," said Watt. "It is not what they call a pure case of it, but it is something like it. The *vis viva* principle comes in, I think, a little in it.

"So if you are running along over a

stony road with a small wagon, and you begin to go twice as fast, so that the wheels strike the stones with twice as great velocity, — the damage is not *twice* as great merely, but *four times* as great; and if you go three times as fast, the damage is *nine times* as great. Boys don't think of this. They don't know how rapidly the damaging effect increases as the speed increases, and so they go smashing their wagons over the stones as fast as they can go, until they are all broken to pieces."

"And that is what you call the law of *vis viva?*" asked William.

"No," said Watt. "That is not what I call the law at all, but only some cases where the law operates. If I were to attempt to state and explain to you the general law, you could not understand it."

"Why not?" asked William.

"It is too mathematical," said Watt.

"Try me," said William.

"Well," replied Watt, "I have no objection to try you. The general law is this: If a body A enter a resisting medium moving with a velocity v, and a second body B enter the same medium with another velocity $a\ v$, then" —

"No," said William, "I don't understand it at all. I don't see any sense in it."

"You will one of these days," said Watt. "You will not only see sense, but a great deal of beauty in it."

"I don't see how there can be any beauty in it," said William.

"There is," said Watt, "a great deal of beauty."

"What kind of beauty?" asked William.

"Mathematical beauty," replied Watt.

"I don't think that is any kind of beauty at all," said William.

"You will alter that opinion one of these days," said Watt.

"When?" asked William.

"When you have studied mathematics," said Watt.

Although William did not understand the mathematics of the subject at all, and though he did not take much fancy to the learned term *vis viva*, he was really much interested in what Watt had told him, — and he obtained a pretty clear idea of the general principle which Watt had brought to his view, namely, that the danger of in-

jury to anything fragile is very rapidly increased by increasing the degree of violence that it is subjected to — so that by simply doubling the roughness of your usage, you very much more than double the wear and tear, and the danger of breakage. You make the wear and tear and the danger of breakage not *twice* as great, but *four times* as great; and by tripling the roughness of the usage,— that is, for instance, going three times as fast over the stones with a frail wagon, you make the damage or the danger of damage, *nine* times as great.

He resolved that for the future whenever he was playing with a cart, or a pair of trucks, or anything of that kind, he would stop and go carefully over rocky ground, or obstacles of any kind, as careful men always did with carts and carriages.

CHAPTER III.

THE GIG-CART.

After having finished the philosophical discussion in respect to the law of the *vis viva* recorded in the last chapter, Watt and William began to talk about the little wagon.

"I could turn some wooden *bushes* in the lathe, I suppose," said Watt, "of some hard kind of wood, for those wheels, and then make a new axle-tree, and put some kind of a seat upon it, so that Mary could amuse herself in drawing her doll about, or some small child — but it would never be suitable for you. Boys like you require as strong wheels as are necessary for a horse."

"Yes, but how can I get such strong wheels?" asked William.

"There is only one way that I know of," said Watt, "and that is to get them made at the wheelwright's."

"And then for the axle-tree and the seat?" said William.

"I could do that work for you," said Watt; "I could do all except making the wheels."

"And would you do it?" asked William.

"Yes, if your mother would allow me to take the time for it from my other work," said Watt.

"How much would it cost?" asked William.

"Why, I think the wheels would cost from five to ten dollars," said Watt; "and then, for my part of the work, it would take, say two days, and that would be two or three dollars more. Then there is the blacksmith work. A wagon for such boys as you ought to be well ironed. I think the blacksmith work would come to a dollar or two. We might perhaps, however, bring it all within fifteen dollars."

"I mean to go and ask my mother about it this minute," said William. So he went to his mother and proposed to her his plan. She listened attentively till he had finished all he had to say, and then she asked a great many questions about the work. Many of these questions suggested difficulties, some of which were rather serious, and William

was afraid that his mother was taking a view of the subject that would lead her to an unfavorable conclusion. At last she said, " Go and ask Watt whether it would be possible to make two top parts to the cart, — one to form a seat for a boy or girl to sit upon in riding, and the other a kind of cart-body, so that it could be used as a hand-cart when you are at work in the garden."

William was at first quite encouraged when he heard this question, and he ran off very eagerly to the shop again. In a few minutes he returned with an answer in the affirmative. That is, Watt said he could make a double top, only it would take him another day, and that, with the additional irons, would make the cart cost two or three dollars more. He could easily make a seat, he said, to take on and off, and also a small cart-body, with a tail-board and all. He could contrive them both to be fastened on with hasps in some way, so that they could easily be taken off and put on.

" Well," said Mrs. Gay, after having heard this report, " I think it is a very good plan. I should like you to have a good strong

cart, that you and the other boys could run with as hard as you please along the road, without fear of breaking it in going over the little stones."

William was a little surprised to hear his mother say this. He had gathered from his conversation with Watt that a boy never ought to go fast along the road over rough roads, but should always go gently and carefully; and now his mother seemed to think that there was something desirable in the idea of a party of boys, when playing horses, being allowed to rattle their carriage along at full speed over the stones. Thus there was at first view an apparent inconsistency.

But there was no real inconsistency between them at all. Watt, when he had talked with William on the subject, was speaking only of the strength of materials and of constructions, and of the effects of concussions in breaking and destroying them; and thus meant only to show that slow and gentle motions were necessary to secure the safety of frail and delicate things.

Mrs. Gay, on the other hand, was thinking of the health and strength of the boy, which

are promoted by vigorous and energetic action on his part. Thus rapid motion is as desirable for the good of the boy, as slow and gentle motions are for the safety of the go-cart. And so what are you to do?

The thing to be done is to furnish the boy with a good strong vehicle, so that when he is playing with it, he can go ahead as fast as he likes. And also to teach him the destructive effect of rapid motion and sharp collisions, so that when he has only frail and delicate things to play with, he may use them gently and with proper care.

Watt, having received his orders, began his work that evening; that is, he began making his plans and drawings. Whenever he undertook any construction of that kind he always made drawings first, in order that all the details might be properly arranged.

The next morning he went with William to the wheelwright's. The wheelwright had a shop near the mill. He made wheels of all kinds for carts, wagons, wheel-barrows, and other vehicles, — though he was seldom called upon to make any so small

as those which Watt came to order. They were to be about two feet in diameter, with iron boxes in the hubs for the ends of the axle-trees to turn in, and were to be bound with an iron tire. The spokes and felloes were to be made of the very best timber for lightness and strength — the wood to be in every part perfectly sound, — and were not to be painted.

After they came out of the wheelwright's, William said that he liked all that Watt had said about the wheels, except that they were not to be painted. He should like them much better, he thought, if they were painted of some pretty color.

"Ah, we will have them painted when the right time comes," said Watt; "but I wish to see them first, so as to be sure that the wood is all perfectly sound. If they paint any wagon or carriage work before you see it, you never can tell how many cracks and flaws there may be in the wood, covered all up and hidden by paint and putty."

When the time came for the wheels to be finished, William went to the wheelwright's shop with his trucks, — for he had

a pair of trucks made with small but stout wheels, by means of which he could haul moderate loads here and there, — and lashing the new wheels securely upon them by a cord, he brought them home.

In the mean time, Watt had advanced considerably in making the axle-tree, and in getting out the stuff for the two tops, — the cart-body and the gig-seat. William of course took great interest in watching the progress of the work. Sometimes he could not make out what Watt was doing. For instance: Watt would take a board and look at his drawings, and then begin to mark out some curious shape upon it by means of compasses and square, and William could not tell what he was going to do; and he would ask what that was going to be.

"I can tell you," said Watt, "or you can watch me and find out yourself, as the work advances. You can imagine that it is a riddle, and you are guessing it, — unless you would rather have me tell you outright."

"No," said William, "I would rather have it for a riddle."

So William watched the processes as Watt went on with his work; and as his plan gradually developed itself, William proposed that Watt should send up the measure for the irons to the blacksmith, in order that they might be all ready when the wood-work was done. But Watt said that the best way was to wait until the wood-work was completed, and then send that to the blacksmith's in order that he might fit the irons to it exactly.

"Why can't you just as well send him the measure beforehand?" asked William.

"He could not work exactly enough to the measure," said Watt. "Neither could I. We blacksmiths and carpenters in the country think that if we work to the sixteenth of an inch we do pretty well, but in fitting iron to wood, in carriage work, we must come a great deal nearer than that."

"I should think he might make it exactly the right length," said William.

"No," said Watt, "that is impossible. It is not possible to make two things of exactly the same length."

"I can," said William.

"Try," said Watt.

So William took up from under the bench two pieces of wood shaped like rulers, only one was longer than the other. He laid the longest one down upon the bench and put the other upon the top of it, and then marked the length *exactly*, as he thought, and finally sawed off the long stick where he had marked it. He then put the two sticks together, and finding, as it seemed to him, that they were of the same length, he brought them triumphantly to Watt, saying, —

"There!"

Watt asked him to set them up together, on end upon the bench, and see if the tops came to exactly the same height.

"Yes," said William, after making the comparison, "they do."

"Suppose somebody should say that there was a little difference," said Watt, — "a *very little*, — and that one was a *very little* longer than the other, and that he would give you a big apple if you could tell which the longest one was; look and see if you could tell."

"I can get as many apples as I want," said William, "without that."

"An orange then," said Watt.

William then examined the ends of the sticks again.

"Yes," said he, "this one is the longest. But it is only a very little the longest."

"True," said Watt, "but they are not *exactly* alike."

"Well, I can make them exactly alike," said William, "for I can cut off a little from *this* one."

So saying, William took the one that was longer than the other, and with a sharp chisel shaved off a little from the end, and then, trying them again by setting them up side by side, he said that now he was sure they were equal.

"They look equal," said Watt, "I have no doubt — but that is not a true test. There is another test much truer than sight."

"What is it?" asked William.

"Feeling," said Watt. "It is very curious that though sight is a much superior sense to feeling in most respects, yet feeling is a much more delicate test of magnitude."

Here William began to feel of the tops of

his two sticks, as they stood upon end before him on the bench, and he said he could not feel any difference between them at all.

Watt directed him to take a large clamp which lay upon the bench, and open it so as just to take one of the sticks in.

A clamp is a very curious instrument, made for holding pieces of wood firmly together when they are glued; for it is necessary when you wish to glue anything that the parts should be pressed very tightly together until the glue is nearly dry. Many children fail in their attempts at gluing from not knowing this, or from not having the means at hand of clamping their work. A clamp consists of two bars of wood and two long wooden screws passing through them, in such a way that the bars of wood can be set at any distance apart that is desired.

Watt directed William to turn the screws of the clamp until he had opened the bars just wide enough to take one of the sticks in lengthwise between the jaws, and then to set the bars firmly in that position, which can be done by turning one of the screws a little more than the other. Then

he told him to put one of the sticks in between the jaws and take it out, and observe how hard the ends of the stick rubbed against the sides of the opening, in being put in and taken out

William did so.

"And now do the same with the other," said Watt.

William tried the other, and found that it would not go in at all.

"It won't go in," said he; "I must open the clamp a little."

"No," said Watt; "don't touch the clamp. But don't you see that if the second stick won't go in it is because it is longer than the other?"

"Well," said William, "I can shave off a little more;" and he tried for some time to make the two sticks of so nearly the same length, that one would rub just as hard as the other, and no harder, in going in and out; but he could not do it. He, however, was convinced of one thing, and that was that he could *feel* a much smaller difference of length between two bars of wood than he could see.

"In great machine-shops," said Watt,

"where they work in iron and steel, they have a kind of instrument which they use expressly to measure with by feeling. They call them calipers. They can feel the difference of a thousandth of an inch, they say, in a steel axle or spindle. In making nice and accurate machinery, they have sometimes to measure as nicely as that; but a *sixteenth* of an inch is as near as we can usually work by measuring, in common carpenter and blacksmith's shops."

When the wood-work of William's carriage was finished, the wheels were put upon the axle, the cart-body was put on, and the seat, which was in the form of a seat for a gig, was put into it; and the whole taken up to the blacksmith's to be ironed. When this was done it was taken to the painter's to be painted. All these operations consumed of course a good deal of time. It was three weeks from the time that the vehicle was first planned before it was finished. When it was finished, and the paint was dry, William was extremely pleased with it, and was very glad that the work had not been hurried through.

The two tops that had been made for the

vehicle, Watt called the cart-body and the gig-body. Either could be taken off from the axle-tree and the other put on. They were fastened on by hasps, which were very strong and secure, and yet could be set free in a moment. William had some difficulty in determining what name to give to the whole vehicle. He could not call it a cart, for sometimes it was a gig; and he could not call it a gig, for sometimes it was a cart. So he concluded to combine the two names and call it his gig-cart. And a most excellent gig-cart it was.

"How long will it take the paint to dry?" asked William.

"About a year," said Watt, coolly.

"A year!" repeated William astonished.

"Yes," replied Watt. "Paint becomes dry enough not to come off on your hands in a week; but it is very tender and will rub off easily, long after that time. It does not get fully hardened till about a year. But this gig-cart of yours is made expressly for rough usage. So you need not wait for the paint to harden. You can knock it about as much as you please, — run it up against posts and trees, and load up the

cart-body with sharp stones. In that way the tender paint will get bruised and rubbed off here and there, but that's no matter."

"Yes, it is a great deal of matter," said William. "I shall do no such thing. I shall be very careful of it, and not run it against anything until the paint gets perfectly hard."

"Then you'll have to be careful of it for a whole year," said Watt.

William very wisely concluded that using the cart-body for work in the garden would be more trying for the tender paint than riding about with the gig, provided he was careful, in riding, not to run against anything. So for nearly a fortnight he was content to use his gig-cart as a gig, and during all this time the cart-body was left in a sunny place to dry and harden.

CHAPTER IV.

A KITTEN EXPEDITION.

William Gay had several cousins who used often to come and make visits to him on his father's farm. He liked very much to have them come, for he had no brothers and sisters of his own to play with. His mother liked to have them come too, for her husband, William's father, was away from home a great deal of the time, and she liked to have one or two of her nephews or nieces there to keep her company.

It would be difficult to say whether the cousins liked best to come in winter or in summer. In winter there were great fires in the house, and pleasant winter-evening parties around them, making candy or popping corn; and in the day-time sliding down-hill and skating, and excursions into the woods, riding on Watt Remsen's big sled; and then towards spring, long walks on sunny mornings on the crust.

In the summer, on the other hand, there were the flowers in the garden, and long walks by the margin of the streams, and birds'-nests and little birds to be seen, and excursions in the woods in search of wild flowers by the girls, and to set traps for squirrels by the boys.

About the time that William's gig-cart was made, and before the paint was dry, two of his cousins, Mary and Louisa, came to see him. They were both little girls, — for Mary Gay was at this time yet quite young. Mary was very quiet and sedate in her disposition, but Louisa was very full of life and gayety, and was often getting into mischief — not from any evil intention, but only from inconsideration and thoughtlessness. They were, however, both very agreeable children, and William liked to have them come and see him very much.

One morning in June, soon after the children came, they were walking together about the yards and garden, after breakfast, when Louisa suddenly pointed before her. and asked eagerly, as if frightened, "What's that?"

It was a black cat that lay crouched down under a bush partly concealed by the grass, and engaged in looking intently forward at something before her.

"O!" she said, a moment afterward, in a tone expressive of a sense of relief, "it's a cat. I thought it was a bear." Then a moment afterward she added, in a voice more excited than ever, "She's going to catch that little bird! Shoo!"

The little bird was hopping along on the walk not far from where the cat was concealed, trying to find little seeds or insects to eat; but Louisa's "shoo!" frightened him, and he flew off up into the tree. The cat seemed to be frightened too; or else, perhaps, finding that as the bird had gone it was of no use to stay there any longer, she began to run off toward the house. Louisa ran after her, calling out, "Pussy, pussy, pussy!"

"It is of no use to try to catch her," said William, who was walking close behind. "She is as wild as a tiger. Mother says she likes to have her wild because she catches more mice."

"She has no business to catch little birds," said Louisa.

"She will catch them, though," said William, "whenever she can. She thinks she must make a spring at everything she sees moving. I kept her running about one day a long time trying to catch a bright spot I made flicker about on the ground with a looking-glass."

"Did not she see you with the looking-glass," asked Louisa, "and so know it was you?"

"No," replied William. "I was up in my room holding the looking-glass out of the window. If I had come near her she would have run off."

"I wish she was not so wild," said Louisa, "or I wish you had another cat that was tame, — or else a kitten."

"Perhaps we might get a kitten somehow or other," said William.

"How?" asked Louisa.

"I don't know," said William. "I will go and ask Watt."

Watt was at this time working in the garden, and so the children all went to the place where he was, and asked him if he knew of any way to get a kitten.

"Yes," said he. "You must go to work

to get a kitten the same way that I did to get a pig."

"How was that?" asked William.

"Why, one morning your mother said to me, 'Mr. Remsen, we ought to have a pig this summer; do you think you can contrive any way to get one?' I said, 'Yes, Mrs. Gay, I have no doubt I can.' Then she said she wished that I would do it. So the next morning I took a basket big enough to hold a small pig, and a cloth to tie over the top of it, and a long cord. I put them all into the wagon, and then set off on a road where a great many farmers lived, and inquired for some farmer who had pigs to sell. I went on in this way till I found one."

"That is exactly what we will do," said William. "We will get a kitten, and have a charming ride into the bargain."

William proposed this plan to his mother, and she had no objection. There was among the other horses in the stable one that was very safe to drive, and besides that William was a very careful driver. There was also a light wagon with a top which kept off the sun, but which had sides that

could be rolled up so as to open the view all around. William determined to take that horse and wagon and go that very afternoon.

Accordingly, immediately after dinner, William and Watt harnessed the horse into the wagon, while the children went to Mary Ann to procure a basket, a cloth, and a string.

"We must spread the cloth over the top of the basket," said Louisa, "and tie the string round it."

"We need not do that now," said Mary Ann. "You can wait till you get the kitten."

"So we can," said Louisa.

So Mary Ann put the cloth and the cord into the basket, and Louisa ran off with it toward the barn, followed by Mary. When the wagon was ready, they put the basket in, and then got in themselves, and set off.

"Go by the way of the mill," said Louisa, "so as to let me see the water tumbling over the rocks."

"But perhaps we may not find any kittens in going that way," said Mary.

"Yes," replied William, "we shall be as likely to find them that way as any other."

So they took the road leading down toward the mill, and when they reached the bridge, and had gone half across it, Louisa asked William to stop and let her look at the water tumbling over the rocks.

William did so, and they all watched the water for some time. They saw the dam too, and the saw-mills, and the great water-wheel, under one of them, going around with such tremendous force, and throwing out the water from it with so much violence, that Louisa said she did not see how they could stop such a big wheel when they wanted to stop it.

"O, they stop it very easily," said William.

"I don't see how they can get under the mill, and go near enough to stop it," said Louisa,—"there is such a spattering."

Louisa did not know of any way of stopping a big wheel like that but to go under the mill and take hold of it. The way they really stop it is to shut down the gate that lets the water in upon it, and then when the water no longer comes to make it turn, it soon stops of itself.

After looking at the mills and the waterfall as long as they wished, William drove on, and crossing the bridge they began to ascend a hill. Pretty soon they came to a small but very pretty one-story white house, with roses and lilac-bushes about it, and a green yard at one side.

"That's a pretty house," said Mary. "Perhaps the people there have got some kittens."

"We can stop and see," said William.

"No," said Louisa. "Don't stop here. I don't believe they have got any kittens in that house."

"Perhaps they have," said William.

"And if they have," said Louisa, "we don't want to get our kitten so near. If we do, she will run away and go home again. We must get her so far away from home that she can't find her way back."

"But we shall keep her shut up until she gets wonted," said William.

"Well, I don't want to get our kitten here," said Louisa, "at any rate, because then we should not have any ride."

This last was the true reason why Louisa

did not wish to stop at this house. She wished to have a good long ride. It would have been better if she had given her true reason in the first place.

People very often keep back the true reasons why they wish something to be done or not to be done, and give false ones in their place, — but it is not a good way. Always give the true reasons if you give any at all.

"That is a very good reason," said William. "I wonder I did not think of that before. We must have a good long ride. We won't begin to ask about kittens till we have gone two or three miles."

So they dismissed the subject of kittens from their minds and thought only of the pleasure of the ride. It was a charming summer afternoon, and the country was very pleasant everywhere. In some of the fields the men were beginning to mow. In others they were hoeing corn and other crops. The children looked at all the farmhouses as they passed to see if they saw any cats at the door, — though they resolved that if they did they would not stop, for they wanted to have a good ride first.

"We would not stop if we should even see some kittens," said Louisa.

"But then," said Mary, "if we should not find any further on, where we are going, we should lose them altogether."

"No," replied William, "for we would remember the place, and then we could call there when we come back."

Thus they went on for two or three miles. The country gradually became more and more wild, and the farm-houses were further apart, and at length William said that it was time to begin to make inquiry.

Just then he saw a man at work in a field, not far from the fence.

"Ah," said he, "there is a man I know. I will ask him. It is Mr. Green. He often comes to our house to bring things to sell."

So when William came opposite to the place where the man was working, he turned the horse out on one side as far as it was safe to go, and then drew in the reins. Mr. Green stopped from his work, and leaning on his hoe, nodded.

"Mr. Green," said William, "have you got any kittens at your house?"

"No," said Mr. Green. "I am thankful to say we haven't." A queer kind of a smile spread over his face as he said this, as if he thought it quite a matter of self-congratulation that his wife had no kittens in the house.

William then touched the horse with the tip of the whip lash, as a sign for him to go on, saying, as he did so, —

"Because we want a kitten, and if you had any we were going to ask you to give us one."

"Give you *one!*" repeated Mr. Green — "if I had any I would give them all to you — even if there were fifty of them."

So saying, and with the same grin on his face, he resumed his work, and William drove on.

"Never mind," said William. "There are more houses out here besides his."

So they drove on, and after passing by Mr. Green's house they came pretty soon to a small and rather poor-looking house standing not far from the road. It was a pleasant place enough, though it looked as if the people that lived there were rather poor. And yet there was quite a pretty

LITTLE JESSIE. Page 27.

garden near the house, and a flower-bed by the side of the door, with morning-glories growing up around a window.

"I don't think it worth while to stop at that house," said William. "I don't believe they have got any kittens there."

"Yes, yes!" said Louisa eagerly, and pointing with her finger. The other children looked immediately in the direction where Louisa pointed, and saw a little girl sitting on the step of the door, giving a pretty little kitten some milk.

"There's a kitten," said she, "and a very pretty kitten too. Let us go and see if they will give it to us."

William turned the horse to one side of the road, so that he could tie him to a post of the fence, and then they all got out of the wagon. Louisa said, — "Come, Mary, you and I will go right up to the house, while William is fastening the horse, and see if they will give us the kitten."

"No," said Mary, hanging back. "I had rather wait for William."

"Then William must be quick," said Louisa.

As soon as William had secured the

horse properly they all went together along the yard to the house. By this time the mother of the little girl, seeing that some strangers were stopping at her house, came to the door to receive them.

The little girl ceased paying attention to her kitten, and looked up at William and the children with an expression of wonder upon her countenance.

The kitten alone of all of them seemed undisturbed. She went on lapping up the milk which her mistress had set before her in a saucer, as if she were thinking of nothing else in the world.

"We wanted to get a kitten," said William, "and thought that perhaps you might have one that you would let us have."

The little girl looked up earnestly on hearing these words, and the expression of her countenance changed from that of wonder to fear. She immediately seized her kitten in one hand and the saucer in the other, forced her way past her mother, and ran off into the house.

"Jessie," said her mother, laughing, and looking into the room where her little girl

had gone, "come back. You need not be afraid. They won't take away your kitten."

Then turning again toward William and the children, she apologized to them for Jessie's abrupt retreat.

"It is the first kitten she ever had," she said; "and she is afraid that something will happen to make her lose it."

Then turning toward the room again, she called, — "Come back, Jessie. You need not be afraid."

"No," said William. "She need not be afraid. We would not take her kitten away from her on any account."

But Jessie was afraid, and would not come back. In fact she did not hear her mother call her, for she had run as fast as she could through the house, and out through a back-door, and down a little path which led to a spring, where she used to go to fetch water for her mother. There she hid in some bushes, at a place where she was out of sight herself, and yet could see if anybody was coming. She put her kitten down and set the saucer of milk before her, and the kitten immediately began lap-

ping it again as if nothing had happened, being wholly unconscious of the imaginary danger which she had escaped.

"We would not take her kitten away from her on any account," continued William, "but we did not know but that you had some more."

"No," said the woman, "I have not any more. This one was given to Jessie."

"Do you think they have got any more where this one came from?" asked William. The woman said she believed they had some more, but it was a good way off, and rather a hard place to find.

"No matter for that," said Louisa. "We'll go."

William asked for more particular information; and the woman said that the man who gave Jessie the kitten was named West. He lived in a lonesome place, she said, off from the main road.

"You must go on about a mile from here," she added, "and then you will come to a place where a kind of by-road turns off from the main road, to the right, at the corner of a wood, opposite a place where there is a trough set to water horses

from, and a small stream of water running into it from a spout. Then you must go about three quarters of a mile in that road, and you will find Mr. West's house. You had better inquire when you get into the by-road. But you will find it a pretty bad road. It will be as much as you can do to get along with your carriage."

"But we can get along some way or other, can't we?" asked William.

"O yes," said the woman, "if you are careful."

CHAPTER V.

A RESCUE AND A RANSOM.

So William and the children returned to the wagon, and William untied the horse while Louisa and Mary got in. They then set off, and after going on for about a mile, they came at last to the place which the woman had indicated to them, where there was a drinking trough on one side of the road, and a kind of branch road leading off on the other, at the corner of a wood.

"This is the place," said Louisa, clapping her hands. "This is it, I'm perfectly sure. There is the drinking-box on one side of the road, and there is the cross-road on the other."

William turned the horse into the by-road, which soon entered the wood, and was, as Jessie's mother had said, a very bad road indeed, looking as if it was very little travelled. It was full of deep ruts and

big stones, and whenever a small brook came in the way, it was crossed by quite a rude bridge made of logs. One of these bridges looked so old and rickety that Mary said she was afraid to ride over it, and so William let her and Louisa get out and walk over while he went over in the wagon very carefully. The horse looked down to it and seemed to examine it very attentively before he dared to step upon it. At length, after going on for some time in this road the party met a man driving a yoke of oxen without any cart. They asked him where Mr. West lived. He told them to keep right on and they would come to it. "You can't get by it," said he, "for it is at the end of the road."

So William drove on, and before long he saw a small wooden house before him, which was, true enough, at the end of the road. He stopped near a pair of bars before the house and fastened the horse, and then he and the two children went up toward the door. This door was at the end of the house, but it was shut, and there was nobody in sight. William heard a sound, however, as of some one behind the house,

and so he went around the corner and there saw a woman drawing some water. She stopped drawing the water, and looked up at the strangers, as if to ask what they wanted. William told her their errand.

"We wanted to get a kitten," said William, "and we heard you had some that you did not wish to keep."

"Yes," said the woman, "we had four or five, and I gave away all I could, and there were two left, which you should have had and welcome, only you are too late. The boys have taken them down to the pond to drown them. I presume they are dead before this time."

"Where did they go?" asked Louisa, eagerly.

"To the pond — a little way down that path," said the woman.

"Come quick, Mary!" exclaimed Louisa. "Run! We shall be in time to stop them! Run!"

So saying, Louisa and Mary set off to run down the path, — Louisa foremost. William followed them, though, as he seemed to have much less hope of being in time to save the kittens, he did not try to

run so fast. When they reached the place, they found two pretty big and rather coarse-looking boys standing by the margin of a small pond of stagnant water, in among the bushes, each having a kitten in his hand, with a string tied round its neck and a stone tied to the end of the string.

Just as Louisa came in sight one of the boys threw his kitten, stone and all, over into the water.

Louisa uttered a scream and ran forward down to the brink. The boys looked at her seemingly very much surprised. They wondered who she was, and where she came from, and the one who had not yet thrown his kitten, which was a gray one, into the water, held back his hand, astonished at such an interruption.

Singularly enough, the kitten that had been thrown into the water did not sink. It is in fact very difficult to tie a round stone to a string in such a manner that it will not slip off when thrown in such a way. The stone in this case did slip off, and sank to the bottom, leaving the kitten, with the string still tied about her neck, struggling desperately on the surface.

Louisa seized a long stick which lay near the margin of the water, and reaching it out, contrived to pull the kitten in toward the shore, until she could get hold of the string, and then drew her gently to the land, and took her out. She then turned to the boys and said, —

"You must not drown these kittens. *We* want them."

The boys said nothing, but looked very much astonished. The gray kitten all the time was mewing piteously. By this time William and Mary had come to the place.

"We want one of these kittens," said William, "if you will let us have her."

"Both," said Louisa, "both. One for me, and one for Mary."

As she said this she took out her pocket handkerchief and began wiping and patting the kitten with it to try to make her dry.

"Poor little thing!" she said.

The kitten mewed continually, and seemed to be in great terror and distress. The other kitten was a gray one. The boy who had it, held it in his hand all ready to

throw into the water, when William said, —

"Don't throw it into the water."

"What business have you got with our kittens?" said the boy, in a threatening and defiant tone.

"No business at all," said William, "unless you let us have them."

"I am going to have this one, at any rate," said Louisa, talking as it were to herself rather than to any one else. And so saying she set off to run up the path toward the house. She had an idea that if she could get back to the house where she could have the woman to deal with instead of those "ugly boys," she would have a much better chance of getting the kitten.

William and Mary of course remained with the boys. They looked at the boys and the boys looked at them, — but not in a very friendly manner.

"If you want our kittens," said the biggest boy, "you ought to pay us something for them."

"How much do you ask?" rejoined William.

The boy paused a moment, — eying Wil-

liam all the time with a shrewd and wary expression of countenance, — and then said, "Five cents."

William hesitated in replying. The affair had taken suddenly such a strange turn that he was for a moment at a loss what to do. He had a certain amount of money, as all boys ought to have, which he was allowed to expend in emergencies at his own discretion, — only he was required to report every expenditure that he made from it the next time he saw his mother. What made him hesitate now was the question whether this was one of the emergencies in which he was authorized to act. He concluded that it was.

"Well," said he, "I will give you five cents. I will give you *six* cents, and then you can divide the money equally. There will be three cents apiece for you both."

It is astonishing how far a little generosity will go sometimes in settling differences and preventing disputes and quarrels. William's generosity in this case, although it was only a cent's worth, seemed to have a magic effect. The boys appeared to become immediately very friendly. William

counted out the six cents, and gave each of the boys three of them. The boy who had the gray kitten in his hand immediately untied the string from her neck, and gave the kitten to Mary, who at once ran off with it up the path where Louisa had gone. William and the other boys followed, all talking together in a most friendly manner.

When they arrived at the house they found that Louisa had gone and taken her place in the wagon, where she was sitting with an unconcerned air, with her hands free before her and no kitten to be seen.

Mary, leaving William to say what more he had to say to the boys and to their mother, ran to the wagon.

"See my kitten," said Mary, holding up the gray kitten so that Louisa could see it. "But what have you done with yours?"

"Are we going to have them?" asked Louisa.

"Yes," said Mary. "William has bought them both."

"O well, then I'll take mine out," said Louisa. "I hid her behind the cushion, so that they could not take her away from me."

So Louisa took her kitten out from the hiding-place where she had concealed her. The poor thing was of course still wet, but she seemed in a great degree relieved from her distress and fears.

"We must not put them in the basket," said Louisa. "We'll carry them home in our laps."

"So we will," said Mary.

"Only I will take a cloth to cover mine up with, for a blanket," said Louisa, "for fear she should take cold. Your's don't need any blanket, for she did not get wet."

Mary assented to this proposal, and by the time that they had arranged everything as they wished, William came and unfastened the horse, and then took his seat in the carriage between them, and so they set out on their return home. On their way, in talking about their kittens, they determined to name the black kitten Ebony, and the gray one Pearl.

"I think we had pretty good luck," said Louisa, as they were riding along. "I like my kitten very much, and I think yours is a beauty, — such a pretty gray."

"Yes," said Mary, "and yours will be such a pretty black."

Thus each of the children was polite enough to praise the other's kitten, instead of boasting of her own. This, of course, made them both feel very happy.

It is a great deal better to say such things as will make people feel happy, than such things as vex and tease them; and for this reason we ought generally to praise other children's things rather than our own. We may *like* our own things as much as we please, but not boast of them too much in speaking to other people.

Louisa's kitten, Ebony, lying in her lap, soon became dry and warm, and seemed to feel contented and happy, — though I presume she was very little aware what a narrow escape she had had, and what a dreadful death it was from which Louisa's interposition had rescued her.

"Look, Mary," said Louisa; "see how bright she looks now!"

"Yes," said Mary, "she looks as bright as mine."

"If she only does not take cold!" said Louisa.

"I think we had pretty good luck," said Mary."

"Yes," said William, "and it was very lucky for the kittens, too, that we came when we did. They ought to feel much obliged to us. We both rescued them and ransomed them."

"What does that mean?" asked Louisa.

"We rescued them by saving them from the great danger they were in," said William; "and we ransomed them by paying the money for them. Money that you pay to save a person from any danger, and make him free again, is called a ransom. Sometimes in Italy, and in other countries where there are robbers, the band not only rob the traveller but carry him away and hide him in some of their dens, and won't give him up until his friends pay a large sum of money to ransom him."

"How much?" asked Louisa.

"I don't know how much," said William.

"I suppose it is a great deal more than six cents," said Louisa.

"O yes," replied William, "a great deal more than that. Hundreds of dollars, I suppose. Thousands, for aught I know."

CHAPTER VI.

AN UNMANAGEABLE TEAM.

When the children arrived home with their kittens, they were of course extremely interested in them, and for a day or two thought of nothing else. They carried them about in their arms wherever they went, and at night they made a bed for them in the basket which was to have been used to bring them home in. William, however, was more interested in his gig-cart, which was now quite dry, though, of course, the paint was tender.

"The very first time I use it I am going to have a grand expedition with it," said William to Watt.

Watt was taking down a scythe while William was talking to him; he was going to mow that day.

"Four horses at the least," said William, "and perhaps six. I know of four boys I can get, I am sure, and perhaps six."

"That will be a large team," said Watt.

"Yes," said William. "The first time I try it I mean to have a big team, so as to show what the cart can do. I am going to set out in front of the house and go off down the road just as fast as the horses can go. It won't hurt the cart to go fast over a good smooth road.

"No," said Watt, "it is strong enough for that, — but if you come to any stones, or a big stick across the way, or a log bridge, or any other kind of rough or jolting place, I advise you to slacken up a little, and go over it gently. I don't think the cart would really break down if you should go on at full speed over such places; but it would get jarred and strained and indented, and in the end it will wear out a great deal sooner with such treatment, than if you are a little careful about putting it to too hard usage."

"I mean to be very careful indeed," said William. "When I come to any bad places I shall rein in my horses, and go over the jolts as carefully as I can; but when the road is smooth, and a little down-hill,

I'll whip up and we'll go like lightning."

William pronounced the word lightning in a very emphatic manner, as if he was quite in earnest in asserting that that was to be the speed of his team; but since it has been ascertained that electricity moves at the rate of from one to two hundred thousand miles in a second of time, according to the nature of the medium which it traverses, it must be confessed that it was rather an extravagant comparison.

There are, however, two ways in which the phrase "like lightning" might be understood, and I don't know which William meant. He may have meant the speed with which the electric flash itself darts across the sky, — or that with which the *light* of it comes through the air to our eyes, which is a very different thing.

The one or two hundred thousand miles a second, varying according to the nature of the medium, is the speed with which the *electricity itself* moves, when darting from cloud to cloud, or from a cloud to the earth, in a thunder-storm, or along a telegraph wire in carrying a message. It

varies a great deal, as has already been said, according to the circumstances of the case, such as the state of the air, or the kind of wire. On the other hand, the *light of the flash*, which the darting of the electricity in the cloud makes there, *comes through the air to our eyes* at the rate, pretty uniformly, of about two hundred thousand miles in a second, — making William's comparison, even in this sense, quite as extravagant as it would be in the other.

If he had said that he meant to make his team go like thunder, it would have been somewhat more reasonable, for thunder is only sound, and that travels through the air very much more slowly than light. It travels at the rate of only about *one* thousand *feet* a second instead of *two hundred thousand miles*. This is the reason why in a thunder-storm we usually see the lightning of any flash, some time before we hear the thunder of it. If, for instance, it is two miles away, the light of it would come to our eyes in the hundred thousandth part of a second, — while the sound of the thunder would require nearly *ten whole seconds* to come that distance. So that we should

see the flash almost instantaneously, while it would take the sound of the thunder, in following the light of the flash through the same air, as long a time to come as we should require to count ten, in counting very slowly.

Still, in saying that he meant his team to go like thunder, — since sound travels at the rate of a thousand feet a second, which is equal to about a mile in five seconds, or twelve miles in a *minute*, — the comparison would still have been very extravagant. If, instead of running twelve miles in one min ute, like the sound of thunder, he could go one mile in twelve minutes, he would do exceedingly well.

If William had said that he meant to make his team go like the *wind*, it would have been a better comparison than any of the others, — for the wind moves at all rates, from a gentle breeze of three or four miles an hour — which a boy might easily equal, in going a short distance — to one of sixty or even one hundred miles an hour, which is the speed that it sometimes attains in great tornadoes and hurricanes.

It will be well, now you have learned

them, to remember these different velocities, as the knowledge will be sure to be often of use to you.

Electricity moves at the rate of from one to two hundred thousand miles in a second, varying according to circumstances.

Light about two hundred thousand miles a second pretty uniformly.

Sound about a quarter of a mile in a second, or from twelve to fifteen miles a minute.

Wind from two or three to nearly a hundred miles an hour.

Watt not only did not believe that William would make his gig-cart go like lightning, but he had serious doubts whether he would be able to make a team of four horses work at all, for any great length of time. He, however, said nothing, but left William to try the experiment.

"One of my whips," said William, "has got a long lash, and I shall crack it about my horses' ears, in a way to make them dance well. Though, come to think of it, there is not a very good snapper on it. The snapper is almost worn out."

So as Watt went off toward the field

with his scythe, William went toward the house to find his whip and make a new snapper to it.

By the time he had finished the snapper the hour arrived for him to go to his studies, and when at length he was again at liberty the first thing he did was to go and see if he could find four or six boys to come that afternoon and be his horses. He only succeeded, however, in finding four. They promised to come that afternoon immediately after dinner.

They kept their promise, being all eager to see the new vehicle. William was ready for them. He had his gig-cart out in front of the house, with what he called the harness, all prepared. The harness, however, consisted only of a rope, — one of the coils that he had made and hung up from the old clothes-line, — and this was fastened by the ends to the two shafts, with a *bight* extending forward.

When William was planning his cart in consultation with Watt, it was quite a question with him whether he should have a tongue to it, or a pair of shafts — a tongue being the arrangement made in carriages

that are to be drawn by two horses or more, and shafts for one. William thought that he should very often wish to have more than one horse, and that accordingly shafts would not do very well.

But Watt suggested that if he had a pair of shafts with a cross-bar fixed across the ends, and made to project a little on each side, — the projecting parts to be formed into handles, — then he could use his carriage for one horse or two, whichever he chose. For if there was but one horse he could go inside the shafts. If two they could go outside, one on each side, and draw by the handles.

This arrangement would be very convenient, also, for any other number besides one or two. For if there were three, one could go inside the shafts and two could draw by the handles; or while two took hold of the handles, the third, instead of going inside the shafts, could go before, and draw by means of a rope, — the two ends of the rope being fastened to the ends of the shafts, inside of the cross-bar, and the third boy being placedin the *bight* of it. And then, finally, if *four* or *six* horses were

required, two could draw by the handles at the ends of the cross-bar, and the others by ropes extending forward.

So William determined to have shafts and a cross-bar; and now that he was intending to have four horses to his team he rigged a rope to this bar, the two ends being fastened to it, just inside of the ends of the shafts, and the middle extending forward and forming a bight, that is a *turn*, within which the other two boys, who were to serve as leaders, were to be placed, and by means of which they were to draw.

This last part of his arrangement was not good. There ought to have been a separate rope, and consequently a separate bight, for each boy, — one attached to the nigh shaft and one to the off one. Putting two boys within one bight was like putting two horses in one harness, made of double bigness to receive them. It was pretty certain that they would be in each other's way, and get into difficulty.

When the boys all came, they were at first so full of curiosity and interest about the gig, — for the gig-cart was now in the form of a gig, — and they were all talking

together about it so earnestly, that William could not get them into their places as a team at all. Then when he began to place them they all wanted to be leaders, that is, to be the pair to go forward. Then, when it was decided which two should be leaders first, and they had put themselves into the bight of the rope, they began to crowd and push each other — each complaining that the other took more than his share of the rope. At length, however, after a great deal of vociferation and scolding and pushing and pulling, William got them arranged, and taking his seat in the gig, he set off with them down the road at the top of their speed. I think they really went as fast as the wind does — sometimes.

Mary and Louisa stood at the front gate to see the team as it drove away. Each of them had her kitten in her arms.

About half an hour afterward William was seen coming back slowly up the road alone — drawing his gig after him, and looking sober and quite tired.

Watt was mowing in a field near the house, and William, after putting his gig-cart away in its place, went to see how the work was going on.

"Well, Watt," said he, when he got near enough to speak, "how do you get along?"

"Pretty well," said Watt. "And how did *you* get along with your team?"

"O, I could not do anything with them," said William. "Those fellows don't know anything about playing horses. It was nothing but disputing and scolding and pulling and hauling all sorts of different ways. At last we came to a log bridge, and they wanted to give me a jouncing over it, by running across as fast as they could go; and when I would not let them, they said they would not be my horses any more. And then I told them they might go off as quick as they pleased, and so they all went off and I brought my gig home alone."

"You were unlucky, rather," said Watt, "in your first coming out with the gig."

"Yes," said William, "but it was the fault of those fellows."

"It was the most unlucky beginning with a team that I ever heard of except one," said Watt. "I knew of one case which was very much like it."

"What was that?" asked William.

"That," replied Watt, "was the case of a sort of crazy fellow who undertook to break four horses to harness all at once."

"Did he?" asked William.

"Yes," said Watt. "The horses had never been in harness at all, any of them, and he undertook to break them in, all at a time."

"And how did he make out?" asked William.

"Just as you might expect," said Watt. "He could not do anything with them. They would not work together at all. When one pulled, another held back. When one wanted to go one way, another would go another. Finally they got all entangled together in complete confusion. They broke the harnesses and upset the wagon, and the whole thing came to a general smash."

William laughed heartily at this result and said, —

"He might have known better."

"Yes," replied Watt, "I think he might."

"That's just the way my horses acted,"

said William, "only they did not break the gig-cart. The gig-cart is very strong. I verily believe that, for all that it is so light, it is as strong as any wagon on the road.

"Did that man mend up his wagon," continued William, after a short pause, "and try again?"

"Not with four wild horses at a time," said Watt. "He took out the tongue from his wagon and put in the shafts, and so when he tried his wagon again he put in only one horse. He worked with him until he had got him well trained to work in harness, and then he took another and trained him, and when these two were well broken, so that they would work well separately, he put them together and taught them to work as a pair. After a while he took the other two, and trained them the same way, and then finally put all four together, and so at last taught them to work very well."

William was silent a few minutes and seemed to be thinking of what Watt had told him.

"That was a very good way," said he, at last.

"Yes," said Watt. "It was a *very* good way. At least it was a very good way for horses."

"I have a great mind to try the same plan with the boys," said William.

"Do you think it would succeed with boys?" asked Watt.

"Yes," said William, "I verily believe it would, and in that way I *might* by and by have a very good team."

"It might succeed with boys," said Watt, — "but I don't know. Boys are pretty hard to manage. I had rather undertake to break in four of the wildest horses you ever saw than to train as many boys to any steady and concerted action."

"What do you mean by 'concerted action'?" asked William.

"Acting all together," said Watt, — "acting in concert."

"I thought concert meant music," said William.

"It does," said Watt. "But the reason why it means music is because in music the players or singers all keep exactly together. If they don't go together, they don't make any music at all."

"That's a fact," said William.

CHAPTER VII.

THE KITTEN-HOUSE.

WILLIAM had made a rule that Mary and Louisa must not take their kittens out to the swing.

The reason why they were not to take their kittens there was, for fear of their frightening away a squirrel that lived in the grove close by.

They had brought this squirrel to the place in his log, the winter before, as related in the volume of this series entitled SUMMER, and the squirrel had continued there ever since. The log remained in the place where they had put it, under the trees in a little thicket, and when the leaves came out, and the grass and flowers grew up around it, it was almost entirely concealed from view.

And yet little Bunny himself never had any difficulty in finding his hole, which was

in a little crotch of the old log, where a big branch had come out. The squirrel had dug out the inside of the log, so as to make it quite hollow, and to afford room for all the stores of nuts and corn that he wished for. One reason why he stayed in his log, after the boys moved it from its former place in the woods to a spot among the shrubbery so near the house, was that William never did anything to frighten him, or to molest him in any way; and he moreover carried out to him from time to time broken ears of corn, and nuts of different kinds, which he placed on the ground, or in the trees about there, in places where the squirrel could easily find them.

The little thicket where Bunny's log was placed formed part of a grove where William and his cousin John had made their swing. The swing was in an opening in the grove large enough for it, and there was a good seat by the side of it. William and John made the seat, as well as the swing. The swing was formed by a frame with sides like the letter A, so as to be braced both ways, and with a stout cross-beam above, extending from the peak of one

frame to that of the other. The irons for the swing were screwed into this cross-beam.[1]

The swing was so near the place where the log was hidden that the children, when swinging, or when sitting on the seat waiting for their turn, could often see the squirrel running about on the trees, playing or looking for the nuts and the corn which William had placed there for him. This was the reason why William was not willing that the children should bring their kittens there. He thought it probable that Bunny might be afraid of them, and so might run off and not come back again.

The children wished very much to take their kittens with them when they went to swing, — for during the first few days after they obtained the kittens, they were accustomed to carry them about with them all the time. So they were inclined to argue that there would not be any danger of the squirrel's going away on account of his seeing the kittens there.

"He can't possibly be afraid of them," said Louisa, "for they are not so big as he is. At least they are not any bigger."

[1] See Frontispiece.

"He may be afraid of them, notwithstanding," said William.

"Besides they would not hurt him if they could," said Louisa. "It is nonsense for him to be afraid of them."

"True," said William. "Fear is very often nonsensical, but you can't always prevent it, notwithstanding."

So William would not allow the children to bring their kittens to the swing, but he said he would make a house for them if Mary and Louisa wished it. They said they should like a house for their kittens very much indeed.

William had a striking confirmation of what he had said about fear that very afternoon; for as he and the children were walking together along the path, through a field, they saw a little green snake coiled up by the side of a rock. I suppose he was asleep.

The girls screamed and ran off along the path, as fast as they could go. William went and sat down on the stone close to the place where the snake was lying.

"Come back, children," said William. "The snake can't hurt you. Come back."

"No," said Louisa, looking back as she spoke, but still retreating.

"Come back!" said William. "The snake is not half as big as you are. How can he hurt you?"

"No matter," said Louisa. "I'm afraid of him."

"Besides," said William, "he would not hurt you if he could, and he could not if he would. It's nonsense to be afraid of him."

"Yes," said Louisa, "he might bite me and poison me."

"No," said William, "there is no poison in him. Such a thing was never heard of as anybody's being poisoned by the bite of a green snake, — or even of being bitten by one."

All was of no avail, however. Neither of the children could be persuaded to come back. They could not conquer their fears, although they knew they were unreasonable.

It is very foolish to be vexed or angry with people on account of their being afraid without reason. Fear is often extremely unreasonable, no doubt; but its power over us is none the less irresistible on that account. Nothing can be more unreason-

able than the fear which little children feel for a green snake, for example; but nothing is more uncontrollable — unless indeed it be the fear of a couple of harmless kittens by a full-grown gray squirrel.

William went to work that very afternoon to build a house for the kittens. He made it in the shop. Watt helped him a little about the planning of it.

When they first began to talk about it, Watt asked him whether it would not be better for him to make two small houses, rather than one, large enough for both kittens.

"Then," said he, "each of the girls would have one to herself. Won't there be danger that if they only have one house for the two kittens between them, they may quarrel about it sometimes?"

"Which?" asked William, "the kittens or the girls?"

"The girls, I meant," replied Watt; "kittens are never silly enough to quarrel. It is only girls and boys that do such foolishness as that."

"Cats quarrel, if kittens don't," said Wil-

liam. "They howl and *miyow* at each other terribly, sometimes, in the night."

"O, they are not quarreling when they do that," said Watt. "That is only their way of talking to each other and playing."

"It's an awful kind of speech they have then," said William.

"Yes," rejoined Watt, "I grant that, but it is not quarreling."

"Cats fight with dogs sometimes," said William.

"Yes," replied Watt. "I admit that cats and dogs are not very good friends."

"But as for Mary and Louisa," said William, "*they* will never quarrel. In the first place, Mary never quarrels with anybody, — she is so good-natured. She always lets Louisa have her own way."

"Then," said Watt, "I think it likely one house will do."

So it was decided to have but one house, and William proceeded to make it. It was to be a kind of box, about eighteen inches long and nine inches wide. It was divided by a partition in the middle into two parts. One of these parts was finished in the form of a cage, with wires, so that the children

could, if they pleased, play that their kittens were lions in a cage. This was Louisa's idea, and William made it so to please her, although it occasioned him to a great deal more work.

The other half of the box was inclosed on all sides so as to make a small room, about nine inches square, which Louisa called the kittens' bedroom. There was an opening large enough for the kittens to creep through, in the partition between the bedroom and the cage, with a kind of sliding door turning on a centre formed by a screw above, by which the passage-way might be closed, and one or both the kittens be thus shut in the cage, or shut out of it, just as the exigencies of the children's play might require. Besides this door between the bedroom and the cage, there was another which led from the cage into the open air, by means of which the kittens could go in and out.

The top of the cage part was fixed, — the wires which formed the sides passing up through it and holding it. But the top of the bedroom formed a lid, which moved on hinges, and which could be lifted up

when necessary, to see what the kittens were about inside. Louisa was very much pleased with this lid. She said it would be very handy for them, in tending the kittens, if ever at any time they were sick.

The middle board, which formed the partition between the bedroom and the cage, was pretty strong, and the upper edge of it projected a little above the cage in the centre, and was there formed into a handle, somewhat similar to the handle of a knife-basket. This handle was an idea of Watt's. He thought it would be convenient for the children in carrying about the kitten-house from place to place. And in order that the whole house might be light, and thus easy to carry, William made it all, except this middle partition, of very thin boards.

When the house was nearly done, Louisa took the measure of the bedroom, and made a bed just large enough to fill it. This bed was made of two pieces of cloth, sewed together all around the edges, and with a sheet of cotton batting between. This made a nice, soft, and warm bed for the kittens to lie upon, and they liked it very much. They liked it after they be-

came used to it, — for at first they did not know what to make of their house, and especially of the cage part of it, and were very eager to get out of it whenever the children put them in. But after a time, by treating them very gently and tenderly, and never forcing them to go into the house when they were in a mood for playing, and especially by feeding them in it very often, the kittens soon learned to feel quite at home in it, and liked it very much.

There was a very convenient arrangement for feeding the kittens in the cage, — one which Watt contrived for this express purpose. The wires in the front of the cage did not come down quite to the floor. The lower ends of them were set in a bar of wood, which passed across from side to side, about an inch and a half above the floor. This space of an inch and a half was too little to allow the kittens to come out, but a saucer could be slipped in there very easily, and then the kittens could drink milk from it. Louisa did not put the milk in the saucer first, for fear of spilling it in sliding the saucer in, but slid the saucer in under the slit first, leaving a small portion of

it outside. Then with a little pitcher she could pour in the milk over that portion of the saucer which projected outside the bar, and the kittens could drink it on the inside.

The place where the kitten-house was usually kept was in a corner of the piazza, which was almost always cool and shady, and where the children liked very much to play. But by means of the handle they could carry it wherever they pleased. Sometimes they carried it from one place to another with the kittens in it. They would lie curled up together inside, in the most comfortable manner possible, and seemed rather to like the ride; though Ebony, which was the name of the black kitten, was at such times very fond of putting his head half out of the door, so that he could peep and see where they were going.

CHAPTER VIII.

TRAINING A TEAM.

In talking with Watt about his gig-cart, and the difficulty which he had experienced in trying to manage four boys as a team, William said that he never meant to try such a big team again. It was lucky, he said, that he did not get his cart all broken to pieces, — strong as it was.

But Watt advised him not to give up the attempt.

"You undertook too much at once," said he. "You must take one boy at a time, and as soon as you get him well used to doing as you say, then take another."

"I will make some rules," said William, "and tell them what they are, and make them all agree that they will obey them."

"No," said Watt, "that won't be a good plan. You must teach them to do just what *you say*, whatever it is. Only you

must be careful never to say or do anything that is not just and right.

"The reason why this plan will be best," said Watt, "is that you can't possibly make rules that will cover all cases, and so you had better act on the principle of deciding yourself in each case, as it occurs. It is *your* cart, and you have a right to decide how it shall be used."

"I might put it to vote sometimes," said William.

"Yes," replied Watt, "you might do that sometimes, if you pleased. But I would not do that generally. Decide yourself, only be careful to decide right. You must be the commander, and they must obey you."

"I thought you was a republican," said William.

"So I am," said Watt.

"And does not that mean putting everything to vote?" asked William.

"It means that in making laws and forming general plans of government," said Watt, "every one should have a vote, for all are equally interested. But when it comes to acting, then we must have au-

thority. Your play with your cart is action, and so it must be regulated by authority. You must have *one* commander, and the others must obey."

"Then they ought to have a right to choose their commander," said William.

"No," replied Watt, "because it is not their cart. The reason why everybody votes in a government, is because all have an equal interest. But the other boys have no interest at all, in the sense of right, in your cart. It is your cart wholly, and not theirs at all. So it is right that you should direct in the use of it, and have your own way. If they don't like your management, they can leave you and go away. And if you don't manage it in such a way as to make it pleasant for them, they *will* go away. So you had better look out, and be just and reasonable in what you do."

William determined to pursue the policy which Watt recommended. Accordingly, a day or two after this he invited John Turner to come to his house and play with him, with the new gig. He very wisely resolved not to tell John, in so many words, that he was going to keep the direction of the cart

— or rather gig, for it was in that form he was going to use it on that day — in his own hands, but to be content with actually doing so, without saying anything about it.

Accordingly, when John came he brought out the gig, and said, —

"Now, John, I am going to be horse first, and you are going to get in and ride."

William was very adroit in doing this, — that is, in making his first command one that John would *like* to obey. John, of course, made no objection to this arrangement, and at once mounted into the gig, and William drew him about his mother's grounds. There were paths enough, wide paths, there, for a good long ride, and William determined not to go any more in the street until he had got a team of horses so well broken to harness, as Watt called it, that he could depend upon them.

After drawing John about for a little while William stopped and said, "Now we will change."

John said, "Draw me a little further. Go as far as to the swing."

"No," said William, putting down the shafts. "I had rather change here." So

John descended from the seat, and William took his place. Then John put himself between the shafts and became horse, and they drove about in that way for some time.

William took care not to let John be horse quite as long as he had been himself, but changed again in good season. Thus the business went on quite amicably for some time.

At length, at one time while John was being horse, William said he had formed a new plan, and he turned his horse round and directed him toward the house. John asked what he was going to do. William said he would see in due time.

So he drove to the house and stopped before the back piazza. Mary and Louisa were there, sitting together upon two low chairs which they had brought out, — the kitten-house by the side of them. As for the kittens, one of them was on the top of the house, and the other was near the edge of the platform, a little way off.

"Girls," said William, "we have come to give you a ride in my new gig."

So saying, William descended from the

seat, and went to the shafts and directed John to come out from between the shafts and take hold outside.

"We are going to have two horses now," said William.

So John came out from between the shafts and took hold of the handle which formed the end of the cross-bar on one side, while William took hold of the other.

"Come, Mary," said William. "Climb up into the seat. You shall go first."

"No," said Mary, hanging back. "I'm afraid."

"Let *me* go," said Louisa, coming forward eagerly. "I'm not afraid. Let *me* go."

"Well," said William, "you shall go first, then."

"And may I take my kitten with me?" she asked.

"Yes," replied William, "the gig is strong enough to bear you and the kitten both."

"And we two are stout enough to haul them both," said John.

So Louisa, taking up her kitten, came to the gig, and climbed into the seat. Mary, when she found that Louisa was going, con-

cluded to go too, and she took hold of the gig behind to run along after it and push a little.

"Now John," said William, "we must not go too fast."

As soon as the gig started the kitten looked alarmed. Riding in a gig was something that she did not understand at all. It was her first experience of riding since the time when she was brought home in Louisa's lap on the day that she was rescued from drowning. So she struggled to get free, and Louisa, fearing that she might scratch her, let her go. The kitten, in making her way to the ground, leaped first to the wheel, not thinking of its being in rapid motion. Of course her feet were caught by it, and she was whirled heels over head and came down upon the grass, turned topsy-turvy. She immediately set off to run back to the house, Mary after her trying to catch her; but she did not catch her, for the kitten had now grown so much that she could run quite fast. She went as fast as she could go to her house, and running in, hid herself in the bedroom, and would not come out for a long time.

Louisa did not seem to care much, but as soon as the kitten had gone she began to crack her whip and call upon her horses to go faster. As they passed by the swing, the squirrel, hearing the noise, came forward from the middle of the thicket, and took a position on one of the outermost branches, toward the path which passed along that way, where he could see what was going on. He saw the gig and the two boys drawing it, and Louisa inside, and Mary, who had come out again, after the kitten had gone into her house, and was running behind. He did not know what it all meant, but he seemed to conclude it was nothing to him; so, as soon as the gig had gone by, he went back to a place in the crotch of a high tree, where he had hid a part of an ear of corn which he was nibbling when he heard the gig coming by.

William and John Turner played with the gig-cart several times after this, until John became well accustomed to William's taking the entire direction of all the movements, and then William brought in another boy. After the *two* boys were well trained he brought in another, and finally

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a fourth. He met with a great many difficulties, and several times the boys went off in a pet, because he insisted on having everything done as he directed. But as he was careful to be always just, and to let each one of them have his share of driving and riding, they were soon sorry for their ill humor and were glad to come back again, and at length, in the course of the summer, he had trained an excellent team of four horses, with which he could drive in his gig wherever he wished to go.

CHAPTER IX

A SUMMER PARTY.

While Mary and Louisa were together at Mrs. Gay's, William proposed to his mother one day that she should let them have a party.

"What could you do at your party?" asked Mrs. Gay.

"We could play about on the grounds for an hour or two," said William, "and then we could come into the house and have games in the kitchen."

"That would make Mary Ann some trouble — wouldn't it?" asked Mrs. Gay.

"Mary Ann is willing," said William. "I asked her."

"It ought to be a cool day," said Mrs. Gay, "or else the children would get too warm running about so much."

"Yes, mother," said William, "we will wait for a cool day."

"You can watch the thermometer," rejoined Mrs. Gay, "and whenever the mercury is at sixty, at eleven o'clock in the forenoon, you may have your party that afternoon."

"Sixty?" repeated William. "How cool is that?"

"That is cool summer weather," replied Mrs. Gay. "Thirty is frosty weather, and ninety is very hot indeed. Sixty is half way between. That would be a cool and pleasant day. A *common* summer's day, such as is good for making the corn grow and for hay-making, is between seventy and eighty. Remember those numbers if you can. Thirty is cold enough for ice and snow. The ice begins to form a little above that — at thirty-two; but it is easier to remember that at *thirty* there is ice and snow and frost everywhere, and no thawing. At *sixty* the air is cool and pleasant, and at *ninety* it is extremely hot. So you can watch the thermometer, and whenever you find the mercury at sixty, in the middle of the forenoon, you will be pretty sure of a cool afternoon, and then you can go round and give your invitations."

"And who may we invite?" asked William.

"Anybody you please," said Mrs. Gay; "only after you have made out the list, bring it to me, and perhaps I shall add two or three names, of children that *I* wish to have invited. Then those that I invite you must consider as my special friends, and so be particularly polite to them."

"Yes, auntie, we will," said Louisa.

For Louisa and Mary had been standing by all the time, listening to the conversation with great interest.

"We will give them the best places," said Louisa, "and let them swing whenever they please."

So it was all arranged. The reason why Mrs. Gay reserved the privilege of adding names to the list was, she was afraid that William might, through forgetfulness, or through some caprice, omit children whom she would not like to have neglected.

There was a large thermometer hanging upon one of the pillars of the piazza, at a place where the sun never shone, but it was so high that Mary and Louisa could not see the mercury, nor the degrees upon

the scale very distinctly, without standing up upon something. So William went and brought a chair from the kitchen, and lifted them both up into it. There was hardly room upon it for them both, but by putting their arms around each other, and clinging together, they could stand pretty well.

William showed them the mark of thirty-two, and the words, WATER FREEZES, opposite to it. Then he showed them sixty and ninety. About half way between seventy and eighty were the words, SUMMER HEAT.

There were various other marks upon the scale, indicating the effects of different degrees of heat and cold, but these were all that Mary and Louisa attended to particularly, for these were all that they could understand.

William, moreover, called the attention of the children to the column of mercury in the tube, and explained to them how in warm weather, or when the mercury was warmed from any cause, it swelled, and the top of it rose in the tube.

"And so you see," said William, "when

the weather is very hot, it rises as high as ninety.

"And then," he continued, "when the mercury grows cold again it shrinks, and the top of it comes down. And when it gets so cold as to begin to freeze, the top of the mercury would be away down here."

As he said this, William pointed to the degree *thirty-two* on the scale, — opposite to which was printed the words, WATER FREEZES.

"And now," said William, "I will breathe on the bulb, and warm the mercury a little, and you can watch the top of it, and see how it rises."

So William breathed in the bulb, and the top of the column of mercury immediately began to rise.

Louisa thought this was very curious, or, as she expressed it, very funny. Then she wished to breathe upon it herself, and William allowed her to do so, only he charged her to be very careful, for a thermometer, he said, was a very delicate instrument.

Louisa breathed upon the bulb, and she was very much pleased to see that the mercury rose faster than when William

did so. The reason was that Louisa put her mouth a little nearer.

The children watched the thermometer after this, every day, but it was nearly a fortnight before it fell near to sixty. It went down below seventy several times in the evening, but in the morning, after breakfast, when the sun began to get high and warm, it went up again nearly to eighty.

At length one afternoon, it grew quite cool, and the next morning there was a fresh breeze from the northward, and the children went out eagerly to look at the thermometer before breakfast. They found it below fifty. It rose gradually after breakfast, but it did not get up to sixty before eleven o'clock, and it was accordingly decided to have the party that afternoon.

So William took his gig and went around with Louisa and Mary to give the invitations. The children took turns in riding. When one was riding the other went along by her side, carrying a little whip in her hand, and playing that William was her horse, and that she was driving him.

The list of invitations had been made

out previously. Mrs. Gay, when she looked at it, found that she did not wish to add any names. So William gave the list to Louisa, or to Mary to hold, whichever of them was riding; and always after he had called at one place he would look at the list, to see whose name came next.

At the second place where they stopped, there was a little girl named Emma True, who was to be invited. She came running to the door when the gig stopped, to see who was coming.

"O what a pretty little carriage!" she exclaimed. "I wish I could have a ride in it."

"You can have a ride this afternoon," said William. "We are going to have a party, and we have come to invite you. We want you to come — at three o'clock."

"I can come *now*," said Emma, looking very eager, and much excited. "I can come now just as well as any time. Wait till I run in and put on my things."

"No," said Louisa, "not now. The party is not going to begin till three o'clock."

Emma looked a little disappointed, but

she perceived that there was nothing to do but to wait till the appointed time, so she made up her mind to be patient.

One of the girls whom they were going to invite was named Dorinda. She was older than Emma, and more quiet and sedate, and was too well acquainted with the usages of polite society to accept the invitation with quite so much promptitude as Emma had shown, in offering to set off at once to go to the party, although it was several hours before the appointed time. She, however, looked very much pleased, and said that she would go in and ask her mother.

Presently she came to the door again and said that her mother wished to know at what time the party was to end. William said at half past eight, that having been the hour which his mother had indicated as the time for the children to go home.

Dorinda went in to report to her mother, and soon came out again, saying that she could come.

The other children who were invited said that they would come, and after going to all the places named on the list, William tore up the paper and set out for home.

The children who were invited, all came in good season. Some came a quarter of an hour before the time. Some of the company were girls and some were boys. But girls or boys, the first thing that attracted their attention was the gig-cart. The boys all wanted to draw it and the girls to ride in it. So William determined to try the plan of arranging a team of four of the small boys, and then giving the girls a ride in turn.

He had some doubts about the wisdom of attempting to manage so large a team of boys that had not been trained at all to the work, but as they were all small boys he thought that perhaps his influence over them would be enough to make them obey his orders.

It was as he expected. The boys, being quite small, thought they must do just as he said, and consequently, as they obeyed all his orders with readiness and alacrity, they made an excellent team, and worked together from the outset perfectly well.

CHAPTER X.

THE CONCERT.

After driving about with the gig until all the girls had had a ride, and swinging, too, in the grove until they all had had a swing, William called four or five of the oldest boys — though they were all pretty small — away from the rest, and told them he had a plan of a concert in the barn, and that they were to be the performers. The rest, he said, might remain where they were, swinging and watching the squirrel, until the concert was ready, and then when they heard the whistle blow they might come.

"And now you boys come with me," said William. So William and the boys all ran off to the barn.

"Now," said William, as soon as they got there, "the first thing is to make the seats for the audience."

He then, asking the biggest boys to help him, moved some empty boxes from a little room where grain was kept in the winter, out to the "barn-floor," as it is called, — that is, a large open space in the middle of the barn. He put the two largest boxes back against the wall, at a certain distance apart, and the smallest ones in front of them; and then brought two long boards which he placed upon these boxes, in such a way as to make two seats, one higher than the other, and the highest one back against the wall.

"There!" said he, "those are the seats for the audience. Now for the instruments."

He took out of his pocket a large whistle which would blow very loud, and said, "Here's one. Who'll be the whistler?"

The boys all began to call out, "I," and "I," "Let *me* be the whistler." In fact, they all wished to be the whistler, partly because the whistle was an instrument that would make a loud noise, and partly because it was one easy to play upon. Seeing this, William put back the whistle into his pocket, and said he would decide by and by.

Then he proceeded into a corner where there were some tools, and brought out a barn-shovel, and afterward went and found a round stick of hard wood to knock upon it with. He said that that was a bass-drum. He also got a cow-bell, which was hanging up upon a peg near by, and a set of sleigh-bells, jingling the cow-bell and he sleigh-bells as he took them down in such a manner as to make all the boys want them. Several of those who first asked for the whistle now wanted the shovel or the bells, and so he had no longer any difficulty in assigning the different instruments.

There were still, however, several boys not supplied; but William contrived very soon to provide for them all. He gave one boy a big crow-bar, which was as much as he could lift, and an old hammer to pound upon it with. To another an old tin pail, and two sticks for drumsticks.

"Now, boys," said William, when they were all provided for, "you must sing as well as play, for this is going to be a vocal concert, as well as an instrumental one. Some of you must bark like a dog, and

some mew like a cat, and some growl like a bear; and if any of you know how, you may howl like a wolf. Do any of you know how to howl like a wolf?"

The boys all said they did, and they immediately commenced the most frightful howling that could be imagined, so that William was obliged to hush them immediately, saying, "That will do! That will do! Wait till the concert begins!"

"Now," said he, "I'm to be the conductor. I shall beat time with this whip-handle, which is to be my baton. As long as I keep waving this about in the air you must go on singing and playing as loud as you can; but when I hold it up high, you must stop as quick as you can. Stop in an instant, the very moment you see the baton go up. I want to see how quick you can all stop."

William then led all the performers into the grain-room, and told them they must remain there, and not speak a word above a whisper until the audience had come in and taken their seats. Then he went to the door and blew a long, loud blast with

his whistle, and all the girls came running in.

There were two girls who had been upon the piazza playing with the kittens, and so had not heard anything about the concert; but hearing the whistle blow, and seeing the other girls running off to the barn, they went too, to see what was going on.

William conducted the company to the seats which he had placed for them. As has already been said, there were two seats, one higher than the other. William intended the high seat for the tallest girls, and the other for the younger ones; but they all climbed up at once to the highest seat. Indeed, the younger and smaller the girls were, the more eager they seemed to be to get the topmost places.

When they were all seated, William went out to bring the band in, as he said. The children waited on the seats in wondering expectation. Their curiosity had been excited by hearing a suppressed jingling of bells, and clanking of iron, and a confused whispering, which came from the grain-room; but when they saw the performers

coming in, bringing in all their shovels and bells and tin pans, everything jingling as they came, they looked at first utterly astonished, and then some of them began to laugh. Some of the youngest of them, however, looked very grave, and even somewhat anxious, as if they did not know but that there was some reason for being frightened.

The musicians took their places in front of the audience, and then William, in a very pompous manner, said: —

"Ladies and gentlemen, there are to be two tunes at this concert. We have not got any programmes. They did not come home from the printer's in time. But the name of the first tune is the 'Song of the Morning Birds.'"

William then, turning to the band, called out aloud to them, "Begin," and immediately commenced waving his baton in the air. Of course the boys, as soon as they began, what with the instruments and what with the voices, made a most dreadful din. Such a thumping and jingling and clanking and rattling and barking and mewing and howling was never before heard, — cer-

tainly such a noise was never made by the songs of the morning birds.

After the performance had continued for a minute or two, William suddenly raised his baton in the air, and the musicians immediately stopped, all except the boy who was beating on the old tin pail, who, not happening to be looking at William at the moment, did not perceive the signal, and so went on drumming a little while after the rest had stopped.

As soon as silence was restored, all the girls began laughing and clapping their hands, calling upon William to "do it again."

But William happened to think just then that perhaps striking the crowbar with the hammer might have the effect of bruising the iron a little, and so making it rough for the workmen's hands; and as he was always very careful not to do any mischief in his plays, he went to examine the bar, and found that the hammer was in fact bruising it a little. So he took it away, saying it was out of tune, and instead gave the boy a big ox-chain, which had been hanging there upon a peg, and with

which he could make a prodigious clanking by alternately raising the end in the air, and then letting it down again so as to cause the links to fall upon each other.

In a few minutes, when the audience had become somewhat quiet, William called for the second tune, the name of which he said was "The Gentle Flowing Stream." The second tune was, if possible, more loud and boisterous than the first; for this time the audience joined, and by laughing, and calling to each other to look at this or that performer, and clapping their hands, added to the general din, — so much so that the noise penetrated to the house, and Mary Ann came to the kitchen door to ascertain what it was. She stood a moment at the door listening, and then, with a smile on her face, went back to her work, saying to herself, "I'm glad they have sense enough, when they wish to make such a noise as that, to make it in the barn."

It had been arranged that after the children had amused themselves by playing about the grounds for an hour or more, they were to come into the house, and play for a while there, and Mary Ann was to

ring the bell when she was ready for them. The bell was rung just as the second tune of the concert had been performed, and so they all set out to go to the house. William and two or three of the other boys remained a few minutes to put all the things away where they had found them. One of these boys was named Orlando. He used often to come and play with Mary and Louisa when they were visiting at Mr. Gay's.

"It was an excellent concert," said Orlando, when they had put everything away, and were following the other children toward the house. "It was the best concert I ever heard in my life."

"Yes," said William, "only, according to Watt it was no concert at all. He says a concert is keeping together, and I am sure we did not keep together."

"No," said Orlando; "everybody did just what he pleased, and that was what made all the fun."

CHAPTER XI.

THE PLAYS.

As fast as the children arrived in the kitchen, Mary Ann invited them into a little room which opened off from it, where there was a bed. It was, in fact, Mary Ann's bedroom. Here they all took off their bonnets and caps, and laid them in neat order upon the bed. There was a looking-glass in the room with a dressing-table before it. The looking-glass was hung upon the wall in such a place as to be of the right height for Mary Ann, and it would have been too high for the children to see themselves in it, if Mary Ann had not had the forethought to place before the table a long bench or footstool, upon which they could stand and see themselves very well.

So as fast as they had taken off their bonnets they came and stepped up upon

the bench, to look in the glass, to see whether their hair was smooth, and also for the pleasure of seeing their faces in the glass, — for there is always something pleasant in seeing your face in a looking-glass.

They were so eager to get up upon this stool and look in the glass, that sometimes there were three or four there at a time, with their cheeks pressed against each other, all eager to see. In fact, one little girl, not strong enough to stand firmly, was pushed off at the end of the bench, and was just going to cry, when little Dorinda, who was near by at the time, took hold of her hand and said, —

"Never mind! Waït till the rest have gone, and then you shall get up with me."

After the girls had all looked in the glass, some went to look out of the window, — for there was one window in Mary Ann's bedroom, which opened upon the yard and garden. It was a very pretty room, and Mary Ann kept it very neatly arranged.

Then they all went back into the kitchen and began to ask Mary Ann what they

should do. She told them to wait till all were ready, and then she would tell them. So they waited until all had come out of the bedroom, and then Mary Ann directed them to follow her. Saying this, she led the way through a long passage to a door, out of which, as soon as she opened it, a bright light came shining. The children all began to run eagerly forward, impatient to get into the room and see what was there. There was nothing very remarkable there; only the time seemed to have suddenly changed to evening, for the shutters were closed and the lamps were lighted, — all signs of daylight having entirely disappeared.

The children were greatly delighted at this magical change, and they began dancing and capering about the room in great glee. Some began to sing, "We've got an evening party! We've got an evening party!" Some ran to get good seats in the arm-chairs and rocking-chairs, and upon a sofa which stood at one side of the room. Some walked about more quietly, and began to examine the pictures upon the walls. William waited a few minutes until the

excitement of novelty had passed a little, and then said, —

"Now, children, all take seats, and I will send Louisa to go and call mother. She said that when we were ready she would come and tell us what to play."

So the children all ran to the seats, and then Louisa went to call Mrs. Gay. Mrs. Gay soon came, leading Louisa by the hand. As soon as she came into the room, all the children left their seats and gathered around her to shake hands with her, and receive the welcome which she gave them, and she said a few words to each one. Then they all went and took their seats again, and Mrs. Gay asked them what they would like to play.

Some named one play and some another, and others still said they wished Mrs. Gay to tell them what to play. So Mrs. Gay called for one play after another, selecting at first such as the children had proposed, while she sat in a large arm-chair near one corner, and regulated the proceedings so as to prevent any of those little difficulties which sometimes occur when children are playing.

THE PLAY OF SULKY SALLY. Page 92.

Mrs. Gay proposed afterwards some plays of her own, some of which the children had never heard of before, and which amused them very much. One of these was a play which she called "Sulky Sally."

This play consisted in one of the children assuming the character of a child in a sulky fit, and the rest gathering around her and trying to make her laugh — she making every possible effort all the time not to smile in the least, or even to look good-natured, but to remain as sober and cross as possible.

Sometimes a boy was the sulky one; but still he was called Sulky Sally just the same.

I am not certain that it was quite polite in the person, whoever he was, that invented this game, to call the sulky one always by the name of a girl, — as if girls were more likely to take sulky fits than boys. Still, this was the way they played it.

In fact, in this case it was a boy who was chosen to be Sulky Sally first. It was Orlando. Mrs. Gay selected him.

"You must go out into the middle of the

room," said Mrs. Gay, "and hang your head, and pout, and look as cross as you can; and whoever comes to speak to you, you must not have anything to say to them, but appear very much out of humor with everybody; and whatever they do to make you laugh, you must not even smile, if you can help it. At last, if they make you laugh, or even smile in the least, you must give up being Sulky Sally, and the one that made you laugh must take your place."

While Mrs. Gay had been speaking she had been busy all the time in folding a newspaper in a curious way, so as to make a kind of cap of it, which she said was the sulky cap for Sally to wear. She gave the cap, when it was done, to Orlando, and said, —

"Put it on your head, and when you laugh you must take it off and say who made you laugh, and give the cap to him, and he must put it on and take your place."

So Orlando put the cap on his head and went out into the middle of the room, and there assumed such a comical look of sulkiness and ill humor that the children began

to laugh at once, all about the room. They also began to gather round him, but at first they did not seem to know what to say.

At last Louisa began to talk to him.

"Sally," said she; "what's the matter, Sally? I'll get a feather and tickle your nose, Sally, and that will make you feel better."

Orlando could restrain himself no longer, but laughed outright, and taking off his cap, he gave it to Louisa. Of course Louisa was now Sally, and all the other children gathered around her and began at once trying all sorts of maneuvers to make her laugh. But they did not succeed very well. She hung her head, and put her finger in her mouth, and kept turning her back to everybody that spoke to her, and wriggled her arms if any one touched her, and in every other way acted the sulky girl to perfection.

The other children all began talking to her, and doing everything in their power to make her laugh. They would say, "Sally! Sally!" "What's the matter, Sally?" "Wouldn't they give you any candy, Sal-

ly?" "It's a shame, Sally!" "O Sally, you don't look pretty when you are so cross. I'll bring a looking-glass and let you see how you look." "Sally, your nose is upside down."

Here Louisa could not refrain from laughing, — the idea of her nose being upside down was so ludicrous. So she gave up, resumed her usual gay and animated look, and gave the cap to William, for it was he that had said that about her nose.

So the play went on until there had been four or five Sallys.

One reason why Mrs. Gay proposed this play was that she thought it might have a good influence upon the children, by showing them what an absurd and ridiculous appearance they made when they were sulky and cross. And I think it did have a good influence, at least for a time, for it was observed that among all the children who were there, not one had a real sulky fit for as much as a fortnight after that party.

The next play which Mrs. Gay proposed was called "Old Contrary." It consisted in a boy or a girl doing exactly the contrary of what they were ordered to do.

"Emma," said Mrs. Gay to one of the girls, "you shall be Old Contrary first, and you must do exactly the contrary of everything I tell you. If I say come here, you must go away. If I say hold your hands up, you must hold them down. If I tell you to take a seat, you must go, walking about the room; and so you must go on, till I say, No play. Now we will begin.

"Keep your seat, Emma."

Emma immediately rose from her chair.

"Come here," said Mrs. Gay.

Emma immediately sat down again.

"Look up on the wall," said Mrs. Gay.

Emma immediately looked down to the floor.

"Sit still in your chair," said Mrs. Gay.

Emma rose.

"Stay where you are," said Mrs. Gay.

Emma began to walk forward.

"Go back," said Mrs. Gay.

Emma continued to come forward.

It amused the children very much, and especially the little ones, to see Emma doing in this way exactly the contrary of what she was bid. Indeed, this play is only intended for very young children, and

might not be at all amusing to those who are older; though sometimes even they might like it for a little while.

A part of the amusement of the play consists in Old Contrary getting caught sometimes, and doing inadvertently the very thing he is told to do, instead of the contrary of it, in which case all the company laugh at him; and he has to go and sit down, and somebody else has to be Old Contrary, and then he must give orders which the new Old Contrary is to obey, or rather to disobey.

Very young children easily get caught in this play, and do the thing they are told to do itself, instead of the contrary. It is usually very difficult to catch the older ones, they are so wary and so much on their guard. Sometimes, however, the older ones get caught. William himself did, in this very game. It was Louisa that caught him. She was giving the orders, for she had been Old Contrary before, and she called William to take her place. At first she gave him common orders, such as hold up your hand and open your eyes, when, of course, he held his hands down and shut his eyes.

At last, when he was standing pretty near her, she suddenly altered her tone of voice, and beckoning to him, said, almost in a whisper, "Come here a minute, William, I want to whisper to you."

William was thrown off his guard by this maneuver, and thought she really had some secret thing to tell him, and before he thought what he was about he stepped forward toward Louisa's seat. She immediately clapped her hands and laughed, and told him he was out.

After they had played the game in this way two or three times, Mrs. Gay changed the form, and played it by giving orders to all the children at the same time, which orders they were of course to obey by the rule of contrary. She began by saying, "All of you keep your seats," when of course they all jumped up immediately. Then she said, "Now stand perfectly still where you are," when of course they began to run hither and thither all about the room. Then, "See how high you can reach," when they all put their hands down upon the carpet. Then, "Now all sit down on the floor," when at once they began to jump

up as high as they could jump. Then, "Orlando, shut your eyes, and all the rest of you keep your eyes open," and so Orlando opened his eyes as wide as he could, and all the rest shut theirs up tight, and began groping about to find the way; when she said, "Now that you have got your eyes shut, keep them shut," upon which they all immediately opened them.

And so it went on until in a short time the whole room became one general scene of noise, excitement, and confusion, which Mrs. Gay did all she could to increase, by giving her orders — sometimes to the whole company together and sometimes to indivviduals — so rapidly that they could hardly keep up with her.

At last she brought the play to an end by saying, "Now all of you must keep moving," when of course they all suddenly stopped and stood still; and then she said, "Now all of you must look sober and not laugh, and especially not laugh loud," when there immediately burst forth from all parts of the room a general chorus of forced laughter, which produced such a comic effect that it very soon turned into a real

laughing, and seemed almost uncontrollable until Mrs. Gay said, "Go on laughing as loud as you can," when they all suddenly stopped, or at least stopped as soon as they could; and Mrs. Gay said, "No play," which was a signal that the play was over.

CHAPTER XII.

SUPPER.

"Now," said Mrs. Gay, "I should think it was time for supper. Go out into the kitchen, William, and ask Mary Ann if she is ready for you."

William returned almost immediately, bringing word that supper was ready.

"Then lead the way out," said Mrs. Gay, "and the children will follow you."

To call the collation which the children were to receive, their supper, seemed very appropriate while they were still in the room where they had been at play, for the candles were lighted, and it seemed exactly like evening. Moreover, supper is the term commonly used to denote the refreshment that is served at the end of a party.

But when they left this room, and after traversing the long passage-way came into the kitchen, they found themselves emerg-

ing into bright daylight again, and some of the children, when they saw the long table which Mary Ann had set, and which was loaded with refreshments of all kinds, said it was a dinner that they were going to have, and not a supper.

The table presented an extremely inviting appearance. There were several large pitchers of milk, with a great number of little mugs to drink it from. There were little pies, and plates of cake, and abundance of bread and butter. There was a dish full of very nice doughnuts, and two plates of large, rosy-looking apples.

"Now children," said Mary Ann, as soon as they came into the room, "if any of you wish to roast your apples, this is the time to put them down to the fire."

There was a large fire-place in the kitchen, with some fire in it, and room enough around it to put down a great many apples. So all the children went to the table, and William held out one of the plates of apples to them and each took one. Some of them went immediately to the fire and put their apples down to roast. Others said that they would rather not have them

roasted, and so they put them in their pockets as they were. Others still, and these were some of the youngest of them, began to bite into their apples immediately.

"Now children," said Mary Ann, "who wants a piece of bread and butter?"

"I," "I," "I," exclaimed the children, and they all began to gather eagerly round the table.

"All who want a piece of bread and butter go and sit down somewhere, and I'll send them some. You can sit in chairs, or on footstools, or on the floor,—wherever you please, but sit down somewhere."

So the children all went and sat down, and Mary Ann gave William a plate of bread and butter to carry to them all. After they had eaten the bread and butter, mugs of milk were distributed in the same way, and then cakes, and doughnuts, and slices of pie, and little apple turn-overs, which Mary Ann had baked on purpose. These apple turn-overs were very nice indeed. Some of the children thought they were the nicest things there were of all that was on the table.

The children did not forget the kittens at

the supper, as they called it, but brought them in to have their share. They put the kitten-house down upon the floor, and fed the kittens with a saucer of milk which they put in at the opening in the cage part.

About the middle of the feast Mary Ann called to the children to be quiet a moment, for she had something to say to them. So they all stopped talking to each other and listened.

"If any of you would like to have some of these things to carry home with you when you go — say Aye."

So the children all called out eagerly in reply — *I*. They thought that that was what Mary Ann asked them to say. But the word was really Aye, a word which means Yes. It is the word which they use in Congress, and in all kinds of business meetings, when they put anything to vote. The people who are in favor of the thing proposed say Aye, instead of Yes. When all who are in favor of it have said Aye, then the president calls upon all who are opposed to it to say No, and they all call out *No* together.

Putting anything to vote in this way

they call taking the Ayes and Noes. Sometimes children, hearing their father use this expression when he is reading the paper aloud, think it is calling the eyes and nose, which is absurd. It is really calling the Ayes and Noes.

In some public meetings, instead of answering Aye and No, they answer Yea and Nay. Then they call it taking the Yeas and Nays. The answer in the affirmative, that is, the one that is in favor of the thing proposed, is always either, Aye or Yea. They never answer Yes in such cases. There is a very good reason why Yes would not be so good a word for the answer as Aye or Yea. I don't believe, however, that any reader of this book could very easily guess what the reason is.

The reason is that when fifty or one hundred people all say *Yes* together, the answer makes nothing but a prodigious *hissing*, which it is extremely unpleasant to hear.

For example, if, in any public body, the president were to say, —

"All who are in favor of passing this law, will please to say Yes," — nothing would be heard but a great hiss, as if the people

answering meant to hiss the law, out of contempt for it, instead of saying they were in favor of it, and wished to have it pass.

Mary Ann was as well satisfied to have her children answer *I* as Aye, and so she said that when they had finished their supper, she would play that they were an army of soldiers, and would distribute rations to them to carry home.

A great many of the children did not know what rations meant, having never heard the word before. They all, however, understood that it meant in some way that they were to have something from the table to carry home, and so were well satisfied.

When the proper time came, after the supper was ended, Mary Ann directed all the children to go into the little bedroom and put on their things, and then to come out and form a line along one side of the kitchen. William was to be the captain, and to see that the line was formed straight, and that all were in their places. While the line was forming, Mary Ann opened a drawer and took out a little pile of sheets of brown paper, each about a foot square. She had made these wrappers ready before-

hand, in accordance with instructions which she had received from Mrs. Gay.

"Now, captain," said Mary Ann, "march your army around the room twice, and then come up along the side of the table, and as fast as the soldiers come to me they will say what they will have. Each one can have two things and no more. When they tell me what they will have, I shall put the things up in a wrapper and give it to them, and then you can march on. That's the way they distribute rations to the soldiers in the army."

"Can the soldiers all choose what they will have?" asked William.

"No," replied Mary Ann. "I'm afraid they don't get much choice — poor fellows; but you can choose."

So when the line was ready, William gave the command, "Right face!" when they began to turn; but instead of all turning toward the right, they turned every way, so as to face in all directions. William, however, soon remedied the error by taking his stand at the head of the column and calling to them to face toward him.

"All face this way," he said. "This is the right."

When at length the faces were all turned in the right direction, William gave another command, "Forward march!" and so marched them twice around the room. Then he went with the head of the column up to the table where Mary Ann was sitting. She asked the first girl what two things she would have. The girl answered, "A turn-over and an apple." So Mary Ann took out a turn-over and an apple, and wrapping them up in one of the papers, gave them to the girl, and then called on the next one for her choice.

She said, "A turn-over and a piece of cake;" and so they went on, each one choosing what she would like best to carry home. Some chose a doughnut and an apple, some a turn-over and piece of pie. Almost all chose a turn-over for one thing.

As fast as the soldiers received their rations, the line moved on, and when at length they were all supplied, Mary Ann directed William to march his troops all out at the door and through the yard to the gate which led into the street, and to stand there and hold the gate open until they had all passed through, and then to call out to them that they were dismissed.

This William did, and when the column had passed through and were dismissed, the girls and boys broke the ranks, and began dancing, and capering about and saying, "Good-by, Mary;" "Good-by, Louisa;" "Good-by, William;" and so they set off for home.

Mary and Louisa, who had their places in the line with the rest for the sake of the fun of marching, after bidding the girls and boys good-by, came back through the gate, and returned with William into the house.

CHAPTER XIII.

THE LIFE-PRESERVER.

One day after William had finished his studies, and was at play with the children on the grounds, John Turner came to see them. He had a pond-lily in his hand.

It was past midsummer at this time, and the pond-lilies were in full bloom.

The children asked John where he got his pond-lily, and he said a boy gave it to him in the street.

"I wish *I* had a pond-lily," said Louisa, and she took the flower out of John's hands to examine it more closely.

It was not surprising that Louisa wished she had a pond-lily, for it is a very beautiful flower.

It has a yellow centre with a great many curious looking pistils and stamens in it, and a multitude of pure white petals surrounding it, in rows, like the petals of a white rose or japonica, only more regular.

"Did that boy have any more?" asked Louisa.

"No," said John, "but he said there were plenty more in the pond."

"Yes," replied William, "I know where they grow — plenty of them."

"Let's go and get some," said Louisa, eagerly.

"Why, you see," said William, "they grow in the water a good way from the shore, so that we have to go out for them in a boat, or on a raft. You would not dare to go out in such a place in a boat or on a raft."

"Yes I should," said Louisa. "I should *like* to go very much."

"You don't know how dark and deep the water is," said William, "and all full of lily-pads and snakes."

"Snakes?" repeated Louisa.

"At least," said William, "the stems of the lilies look just like snakes, all curled up in the water down as far as you can see. And for aught I know, there may be real snakes there among them. It looks like just the right place for them, — or eels."

"I should not care so much about the

eels," said Louisa. "Could the snakes get into the boat?"

"O no indeed," replied William. "They would not wish to do it. If there were any snakes there they would swim away as fast as they could, the moment they saw the boat coming. But I don't believe there are any snakes there, — only eels. There may be some eels. And if I thought there were, I would take my fishing line there the next time I go, and see if I could not catch them."

"Let us go to-day," said Louisa eagerly. "Only you must not take your fishing line. We will only get some lilies."

"We might go just as well as not," said William. "I will go and ask mother."

Perhaps the reader will think that there could be but one possible result of such an application as this to William's mother, as most mothers would not for a moment have entertained such an idea as that of a boy like William, with only another boy still younger than himself to help him, going out in a boat upon a solitary pond, with two little children, to gather pond-lilies, — especially when we consider that in gather-

ing pond-lilies you have to lean over the side of the boat and reach down far into the water, so as to get long stems, which is, in some respects, the most dangerous position a person can assume in a boat, — since if you reach a little too far the boat may go over.

Many mothers, in fact, make it a principle to restrict their boys as much as possible in respect to all doubtful, difficult, and dangerous undertakings of every kind; and when the boys ask permission to do any such things they say "No," at once peremptorily. But Mrs. Gay wished to make a man of William, and so she wished to train and inure him to all kinds of difficulty, and even to accustom him to be in situations of danger, whenever she found that the necessary precautions could be taken to make it prudent to do so. Accordingly, when William proposed to her any expedition or undertaking which appeared to be not safe, — instead of deciding at once against it, she tried first to see if there could not be some way contrived to make it safe, so as to allow him to attempt it.

Accordingly, when William made his

proposal to her, — that she would allow him and John Turner to take the children to the pond, and there go out in a boat to gather pond-lilies, — instead of answering at once that she could not think of such a thing for a moment, she began to ask questions with a view of obtaining more information.

"How far is it to the place?" she asked.

"About a mile," said William, "through the woods."

"Then you propose to go through the woods?" said Mrs. Gay.

"Yes, mother," replied William, "for it is as much as two miles to go round by the road."

"And suppose you get lost in the woods — going or returning?" said his mother.

"Then I should look at my compass," said William. "If I keep on exactly south by the compass, I shall come to the road sooner or later."

William had had a visit from his cousin John some months before this time, and John had explained to him all about the compass, and the use of it in enabling a person to find his way out of the woods;

and afterward William had saved his money and bought a compass for himself, which he now always took with him when he went off on excursions of any kind.

"Are you sure you can get a boat to go out in, after the lilies?" asked Mrs. Gay.

"If it is only at home," replied William. "I am sure that Mr. Westerly will let me have it, if it is at home.

"And if *he* is at home too," he added, after a moment's pause. "But then if he is not at home himself, Mrs. Westerly will let me have the boat, I am sure."

"How would it do for Watt to go with you," said Mrs. Gay, "to take care of you in case of accident?"

"But, mother, he is busy with his work," said William.

"O, I could arrange with him about his work," said Mrs. Gay.

"But we don't want anybody to take care of us," said William. "We are going to take care of ourselves."

This was the true reason why William did not wish to have Watt go with them. He wished for the glory of managing the expedition himself alone, — without help of any kind

"Very well," said Mrs. Gay, at last, after a moment's pause. "I will think of it and let you know by and by. You can come in again in about an hour."

So William went out to his play with Mary and Louisa, and in about an hour they all went in together to receive Mrs. Gay's decision.

"Well, mother," said William, "are we to go?"

"I have concluded to let you go on one condition," said she, "and that is that I put a life-preserver on board the boat. I am afraid to have you four go out upon the water in a boat without some provision in case of accident. I suppose the water is pretty deep?"

"O no, mother," said William. "It is not very deep."

"How deep is it?" asked his mother.

"I don't know exactly," said William. "We can't see the bottom very well."

William was so eager to be allowed to go for the lilies that he did not hesitate to say that the water was not deep, when he had no means of knowing whether it was deep or not.

Some people might say this was telling a lie. But it was not a lie. It was wrong, but it was not a lie. A lie is when a person says what he *knows* is *not* true. To say a thing when you don't know whether it is true or not, but only imagine it is true, or think it is true because you wish it to be so, is a very foolish thing to do, but it is not a lie.

If William had tried some time when he had been out upon that water, by means of a long pole, and had found that the water was over a man's head, and then had told his mother that it was only knee deep, in order to induce her to let him go, — that would have been a lie. But William would not have done that on any account whatever.

"Your not being able to see the bottom," said Mrs. Gay, "shows that it at least *may* be very deep. And then, besides, you may perhaps have to go over deep places on your way to where the lilies grow. And I am not willing to have you go with the children alone, unless you take a life-preserver with you in case of accident."

"I did not know that you had any life-preserver," said William.

"And yet you have seen it a great many times," said his mother.

"And did not know that it was a life-preserver?" asked William.

"You might have known that it could be used as a life-preserver," said his mother, "if you had thought. But whether you ever did think of it or not I can't say."

"Well, what is it, mother?" asked William, "and where is it?"

"Ah, that is my secret," said Mrs. Gay. "You will not know till you see it on board the boat."

"Who is to put it on board the boat?" asked William.

"O, I shall make arrangements for that," said Mrs. Gay. "You will have nothing to do with it. You will find when you come to get into the boat that the life-preserver is there, and you must not make any objection to taking it."

"O no," said William. "I should *like* to take it. I should like to go in a-swimming with it, and have some fun with it in the water. I wish you would tell me what it is."

"No," said his mother, "you must wait till you see it on board the boat."

"May I guess what it is?" asked William.

"Yes," said his mother, "you may guess twice."

"A barrel?" said William.

"That is one guess," replied his mother. "Now for the second."

"Some kind of an air-cushion?" said William.

"No," said his mother, "neither of the guesses are right. And now let us see whether we understand the bargain. I allow you to go on condition that you allow me to put on board the boat any kind of life-preserver I please, and you are not to make any objection to it."

"Unless it is so big as to be in our way in managing the boat," said William.

"No," said his mother, "it shall not be in your way, and shall not interfere with your operations in any way, and you are not to make any objection, whatever kind of a life-preserver it may turn out to be."

William agreed to these conditions, and that afternoon, immediately after dinner, he set out with John and the two girls on the expedition. He took care to put his

compass in his pocket, and he also borrowed a basket of Mary Ann to bring the pond-lilies home in.

"I don't see how mother is going to get the life-preserver over there," said he, "unless she sends Watt to carry it."

"She *will* send Watt with it," said Louisa, "I am sure."

"We will see," said William. "But if he don't get there in time, we shall go off without him. For she took all the responsibility of seeing that it was on board the boat when we were ready."

"She will have it there, you may depend," said Louisa.

The children talked in this way together, as they went on through the woods, and at length, in due time, they arrived in sight of Mr. Westerly's house. It was the same place where William and his cousin John obtained a boat in the spring, to raft their lumber to the mill. As soon as they came in sight of the place, quite to their surprise, they saw Watt standing at the landing, near the boat.

"There's Watt," exclaimed William. "How did he get here before us?"

The truth was that Watt had come to the place by another path through the woods; but as he walked faster than they, he had arrived before them.

"I told you he would come," said Louisa.

"Yes," said William, "but I don't see any life-preserver."

"Perhaps he has put it in the boat," said Louisa.

So William and his party ran on as fast as they could, in order to look into the boat and see the life-preserver. As they approached, Watt himself stepped into the boat, and went forward near the bows.

"Watt," said William, "where is the life-preserver?"

"I'm the life-preserver myself," said Watt. "Where shall I put myself to be most out of the way?"

"Now Watt!" exclaimed William, in a complaining and disappointed tone, "that is not fair. I did not know that mother meant *you*."

Watt said nothing.

"William," said Louisa, speaking in a tone of earnest expostulation and remon-

strance, "you said you would not make any objection."

The truth was that Louisa was pleased with the prospect of having Watt go with them in the boat. For what she had heard about the deep water, and the twisting stems of the lilies, and the snakes and eels, had made her somewhat afraid to go out in the boat under the sole care of William and John.

"You said *positively*," she continued, "that you would not make any objection, no matter what kind of a life-preserver it should be."

"Well!" said William, with a sigh expressive of resignation, "let him go. Can we have the boat?"

"I don't know anything about it," said Watt. "I have not asked. I have nothing to do with the arrangements. I am only a life-preserver, and have nothing to do except to save you in case you fall into the water."

"Then," said William, "I must go up and see if we can have the boat."

So William went up the path which led to the house, and soon returned, bringing

the paddle with him. John had got into the boat while he had been gone. He helped Mary and Louisa in, and told them where to sit. Then he cast off the painter, and stepping on board himself, and taking his seat at the stern, he pushed off from the shore.

Watt assumed as comfortable a position in the bow of the boat as he could make for himself, and looked perfectly indifferent and unconcerned.

There was a small raft of three or four logs near the landing, and a quantity of drift-wood which had been floated up against it, and had become lodged there, so as to obstruct the passage out; and William, in trying to pass by these obstructions, got the boat aground. In fact, at this season of the year, the water was very shallow there, and it was difficult enough to navigate the boat out to deep water when there was nothing in the way.

Watt, however, paid no attention to the fact of being aground. He did not even seem to notice it at all, but looked about him, up and down the stream, with a listless and indifferent air, as if he were thinking of something else all the time.

"She is aground, girls," said William. "But never mind. I'll have her off in a minute. You must both come this way, and that will ease her a little forward, and John must help me push with the paddle."

After a good deal of tugging and pushing with the paddle, William and John got the boat off again, and she was soon in deep water; and then, when once under way, William had no difficulty in going on. They soon reached the place where the lilies grew. Louisa and Mary were greatly delighted with the sight of them, floating like white stars on the water, among the large, oval leaves.

William pushed the boat in directly among them, so as to give the children an opportunity to gather as many as they desired by reaching over the gunwale of the boat into the water. Some that they gathered were buds and some full blown flowers.

After they had gathered enough, William put them all together, and winding the stems round and round into a coil, he put them into a basket, and then turned the head of the boat toward the landing again.

But Louisa, who now felt quite safe in the boat, proposed that before going to the shore they should take a little sail out on the mill-pond. William looked toward Watt to see whether he would make any objection. But Watt seemed to be lost in his own reflections, and apparently had not even heard what Louisa had said. At any rate he made no objection, and so William turned the boat toward the mill-pond and paddled about there for some time, giving Mary and Louisa a very pleasant excursion.

When at length they reached the landing, Watt, who, being at the bow, was nearest the land, stepped out upon the sand, and walked away. He did not even hold the boat while the others got out. After going a few steps he turned round to see that the children had all safely disembarked, and then he went into the bushes and disappeared.

William fastened the boat, and then carried the paddle up to the house, taking with him two or three of the lilies to give to Mr. Westerly's children. After this they all came home through the woods, their own way.

CHAPTER XIV.

THE WHIRLIGIGS.

One cool day in the latter part of August, for in the part of the country where William lived it was sometimes very cool even in August, William told Watt that he had an idea of going that afternoon into the woods and making a camp.

"It is cool enough to-day," he said, "for us to have a fire."

"No," replied Watt, "that won't do. You must not make fires in the woods at this time of the year."

"Why not?" asked William.

"Because everything is so dry that the fire might get away from you and run."

"And run?" repeated William.

"Yes," said Watt, "run in the woods, among the dead leaves, and branches, and dry logs, and roots. You can go and have a camp if you please, and have everything except a fire."

William thought that a camp in the woods without a fire, would be a very imperfect form of enjoyment. And when, after dinner, John Turner came to see him, and he proposed the plan to him, John said he thought it would be better to go a-fishing.

"Ah yes," said William. "That will be just the thing. I wonder I did not think of that before."

But Mary and Louisa, who were with the boys at that time, did not like the fishing plan.

"We would rather you would go a-camping," said Mary, "for then we can go too."

"But you can go a-fishing with us very well," said William. "You can sit on the bank and see us fish."

"No," said Mary, "we should get tired of sitting still there all the time with nothing to do. Besides, I don't believe you will catch any fishes. And then you won't stay in one place, where it is pleasant, but will go scrambling through the bushes, into bad places, where we can't go."

Mary had gone on fishing excursions before with William, and knew very well how it was.

"We'll let *you* fish, Mary. We will let you and Louisa fish," said William, eagerly. "I will make two lines for you, and put hooks and all on them, and cut little poles for you, and you can stand on the bank and fish, — just as we do."

Mary did not seem more than half satisfied with this proposal. Louisa appeared to be more pleased.

"Yes," said she. "I should like that very well. Only" — she added, and then paused.

"Only what?" asked William.

"Why, we might possibly catch a fish on our hooks, and then what should we do?" said Louisa.

This idea of making the possibility of catching a fish an objection to the plan of going a-fishing, was so new that William and John both began to laugh.

"Well," said Mary, "you may laugh, but what *should* we do?"

"Why, John or I would come and take the fish off the hook for you," said William.

"But you might not be near by," said Mary. "And besides you might be catching fishes on *your* hooks at the same time."

It must be confessed that Mary had the best of the argument so far, but she was finally overruled — or rather she finally allowed herself to be persuaded to help make up a fishing party.

So William and John fitted up two fishing lines for the two girls, and then they all set off toward the woods, intending to follow a path which led through them till they came to the brook. It was, in fact, the same road that they had taken on the day when they went to gather pond lilies.

In due time they arrived at the bank of the brook, where they found a very pleasant place, and they remained there more than an hour. The boys caught a few small fishes, and even the girls thought that they had a bite once or twice; but much to their relief, the biters, if biters they were, went off without getting caught by the hook.

After holding their lines in the water some little time, the two girls took them out and laid them down on the grass, and went rambling about in the neighboring openings, looking for hiding-places, and gathering wild flowers, which they found a

much more agreeable occupation than fishing.

William was in fact gentlemanly enough to leave his fishing at one time, and go and help the girls make a little bower, by cutting them some hemlock branches to make it with. He cut these branches with his little axe, — for he always took his axe with him, and also his compass, whenever he went into the woods.

While cutting these hemlock branches William came upon a curious piece of wood, which, though faded and colorless on the outside, seemed toward the centre, when he cut into it, to be beautifully variegated with different shades of red and brown. I believe it was a branch of cedar of some kind.

William stopped to examine this wood, as was always his custom with everything curious that he found.

"I mean to carry up a piece of this wood and show it to Watt," said he. "He likes all curious kinds of wood. Perhaps he can make something of it."

So he cut off a piece of the wood about a foot long, and laid it down with the axe by the side of his fish-basket, and then re-

sumed his fishing, while Mary and Louisa went on with the work of building their bower with the branches which he had cut for them.

The children played in this way for an hour or two, and then they all set out on their return home. William carried the basket and the piece of fancy wood, while John took the axe. Mary and Louisa ran on before with a bouquet of wild flowers, which they had gathered. Louisa said she could not imagine how boys could care so much about getting a parcel of wet, sticky fishes, when flowers were so much prettier, besides being clean.

As soon as they arrived at the house, they all went in pursuit of Watt, to show him the fancy wood, as William called it.

Watt was in the garden. They all went directly to him, and handed him the wood. William asked whether it was not pretty wood, and whether he could not make something out of it.

Watt looked at it quite attentively.

"I don't know about making anything out of it," said he, "but I see there are some beautiful things in it, already made, — if I can only get them out."

"Things in it already!" said the children, very much surprised. "How could they get in?"

"It is wonderful," said Watt. "But I think I see two little whirligigs, and a pretty handle. It looks like the handle of some tool. I will try, by and by, and see if I can't get them out. Go and put your fishing apparatus and everything else away, and then come here again, and I'll go with you to the shop, and see if I can't cut away the outside wood carefully and get those things out."

So when the children came back, Watt went with them to the shop, and there, after preparing the wood a little, he put it in his lathe, — which, as I suppose the readers of this book well know, is a curious kind of machine, by which any piece of wood may be made to whirl round very rapidly between two pivots by which it is supported at the ends, and while it is thus whirling, the edges of cutting tools may be brought to bear upon it in such a way, as to make chips fly off in great abundance, and finally to cut the wood into almost any shape that may be desired.

Watt placed Louisa and Mary in convenient positions on little benches on each side of the lathe, so that they could see him work. William and John could see without being raised up at all. Then he went to work. He cut away the wood at one end of the stick while it was whirling, — keeping it whirling all the time with his foot, by means of what is called a treadle, which made the wheels of the lathe go round, until at last the form of a little top, shaped like a teetotum, began to appear, — that is, a little top with a stem to it, by means of which it could be twirled with the fingers. Watt called it a whirligig.

"There," said Watt, when the top was fully shaped. "I thought I saw this little top in here."

"O Watt!" said Louisa, "the top was not in here at all. You made it."

"No," said Watt, "I have not done anything but cut away the wood that was outside of it. I have not cut the wood of the top at all.

"And I think I see another little top just like it further along," he added.

When the top was finished, or, as Watt

would have said, fully brought to view by having the wood cut away that was around it, Watt polished it, and then cut it off and gave it to Louisa, who immediately went away to twirl it on the bench. Then after *centering* the wood again, as he called it, he cut out another top for Mary. There was still a considerable length of the wood left, and from this he soon brought out a very pretty tool-handle for John, and when it was done he put a brad-awl into it, so that John could bore with it.

There was not wood enough left to make anything for William, but Watt said that if William would bring him another piece of the wood, he would see if he could not find something in it for him.

"O Watt," said William, "these things are not *in* the wood. You make them."

"I make them!" replied Watt. "Why, I do not do anything but cut away the outside wood, so as to get at them. All the wood that I have cut is in chips on the floor. I have not cut the tops or the handle at all, — nor done anything else to them, except to get them out.

"And I can see another little top," he

added, — "very small, inside of Louisa's top, — a beautiful little thing!"

"O Watt!" exclaimed William. "How can you possibly see it?"

"With my mind's eye," said Watt.

"Nonsense!" said William. "That's no seeing at all."

CHAPTER XV.

WATT'S LECTURE.

One rainy day, while Watt was at work in the shop, mending the rakes by replacing the teeth which had been broken out during the preceding week, in raking hay, William came in, very intent upon a plan which he had formed of making a nail-box.

"Watt," said he, "I am going to make a nail-box."

"A nail-box?" repeated Watt.

"Yes," rejoined William, "and I want you to help me about it."

"I can help you by my advice, if that will do," said Watt. "I can't do any of the work for you very well."

"No matter," said William, "I can do the work myself, if you will tell me how to do it."

Watt said he was very willing to aid William in his undertaking so far as he

could do it by his counsel and advice, but first he wished to know what William's idea was, and his plan, so far as he had formed a plan.

William replied that he had not formed much of a plan, only to have a nail-box to keep his nails in, with little compartments for the different sizes.

"Good," said Watt. "And shall you keep screws in it, too?"

"Yes," said William.

"And tacks and brads?" asked Watt.

"Yes," replied William. "Everything of the kind."

"Very well," rejoined Watt. "I think it is an excellent plan. I will give you my advice from time to time as you go along, provided, however, you first agree to follow the advice I give you."

"Why can't you give me the advice, at any rate," said William, "whether I follow it all or not?"

"Because if I undertake to advise you about it much," replied Watt, "I shall have to give some time and thought to the subject, and shall be in a measure responsible for the success of the work, and of

your getting a good nail-box in the end; and I am not willing to take that trouble and responsibility unless you will agree to do as I say."

"Very well," replied William, "I agree to it."

"First, then," said Watt, "I shall give you some general advice, that will apply to all jobs of this kind undertaken by boys. I shall give it to you in a lecture. Come and sit up here on the bench near me, and I will give you the lecture."

At first William did not much like the idea of stopping to hear a lecture before beginning his work. He was in a hurry to begin his nail-box, and he told Watt that he thought it would be better for him to give him his advice from time to time, as the work proceeded. Watt said that that would do very well in regard to some parts of the advice he should give him, that, for example, which related to the particular things to be done. But he wished to give him a lecture on some general principles first.

"I can hear the lecture," replied William, "while I am at work sawing out the stuff. I want the work to be going on."

"You promised to follow my advice," said Watt, "and I advise you to come here and listen to the lecture."

So William, who was always very honorable in keeping his agreements, came and mounted upon the bench near where Watt was at work. Besides being influenced by his desire to do readily whatever he had agreed to do, he always liked what Watt called his lectures, for Watt always contrived to make them not only instructive but amusing. When he was ready, Watt, continuing his work all the time of fashioning his rake teeth, commenced his lecture as follows: —

THE LECTURE.

"I propose to give you some instruction on this occasion, young gentlemen, on the course of procedure which you should adopt, in any mechanical operations which you may undertake, in order to bring them to a reasonably speedy and successful issue."

Watt said "young gentlemen," in the plural, although there was only one boy

listening to him. He usually employed this phraseology on such occasions, and by so doing created a kind of illusion in William's mind, as if he were in an assembly of boys who were listening to the lecture together.

"All such undertakings," continued Watt, going on with his lecture, "should be carried on with *system*, *moderation*, *steadiness*, and *perseverance*. Thus my discourse naturally divides itself into those four heads.

"1. *System*. If, for example, you undertake to make a nail-box, the first thing to be done is to *plan* your nail-box in a systematic manner. To do this you should get specimens of all the different kinds of nails, tacks, brads, and screws, and lay them out before you on a bench, and thus determine how many compartments you will need in your box, and also what shall be the size of the several compartments. Of course, the larger nails and screws require more space than the smaller ones. You will also consider whether you will have a tray or not. It is common to have

a nail-box with a tray; the tray forming an upper story, as it were, for the smaller articles, such as tacks, and brads, and small screws, while the larger ones go in larger compartments in the bottom of the box."

"I mean to have a tray in my box," said William.

"Young gentlemen will please not interrupt the lecture," said Watt.

William laughed, but Watt remained perfectly sober.

"When once you have formed your plan," continued Watt, "you must divide your work into stages. The first stage would be getting out the stuff for the top and bottom, and for the sides of the box. Getting these pieces out, and planing them and matching them as to size, so as to have them all ready to fit together, might make one stage of the work. Gluing and nailing these pieces together would be another stage. Sawing the box apart, to separate the part which is to form the cover from the body of the box, and putting on the hinges, would be the third stage."

"Would you have a cover to my nail-box?" asked William.

"Young gentlemen will please not interrupt the lecture," said Watt.

But although Watt thus reproved the interruption, he took notice of the point brought up by it, for he went on to say, —

"In forming your plan, you will have to consider, young gentlemen, among other things, whether you will have a cover to your box. If you are a carpenter, and expect to be in your shop all the time, and to have occasion to use your nail-box a great deal, then it is best not to have a cover, as it is easier to get at the nails without one. But if your box is not to be in use all the time, but only occasionally, then it is better to have a cover, so that when it is not in use you can shut it up and put it away."

"I mean to have a cover to my nail-box," said William.

"2. The second head of my discourse," said Watt, without heeding the interruption,

"is *moderation.* You must go on moderately — one stage of your work at a time. The great trouble with *small* boys is, that when they undertake any mechanical or other similar work, they are always so eager to get through with it, and to have the thing done, that they hurry, and make mistakes, and spoil one part after another, and finally get discouraged, and perhaps throw the whole thing away. But you, young gentlemen of my audience, are old enough to have outgrown such folly. You ought to have sense enough to work with moderation. Be satisfied with accomplishing one stage of your work carefully and well, each day. Do not attempt any more. When that stage is accomplished put your work away for that day, and rest from it. When you are making a nail-box, for example, which is perhaps to last you all your life, it is better to go on moderately, and do every part carefully and well, than it is to hurry and drive the work, so as to half spoil it, for the sake of getting it done a day or two sooner."

William said nothing to this, though he

resolved to get his nail-box done as soon as he could, without hurrying and spoiling it.

"3. The third head of my discourse," continued Watt, "is *steadiness*. You must go on with moderation, it is true, but you must go on steadily. You must be content with advancing the job one stage every day, but you must be resolute in advancing it that stage. Then the work will be steadily going on, and in due time will be finished."

"I might do two stages in a day," said William, "one in the forenoon and one in the afternoon."

"When I say one stage every day, I mean one stage at each working," said Watt: "you divide the whole work into separate portions or stages, and never attempt to accomplish more than one at one period of working. When you have finished that stage, put the work all away and rest upon it. It will generally be best not to undertake any new stage on the same day; but sometimes this may be done, if

you make a separate work of it, at a different part of the day.

"4. I come now," said Watt, continuing his lecture, "to the fourth and last head of my discourse, which is *perseverance*. Don't begin any work till you have carefully considered how much time it will take, and what difficulties you will have to encounter, but when you have once decided to begin, persevere until you have finished it. Small boys are very apt to lose their interest in what they have undertaken, or change their minds about it, and give up the work before it is finished, and so lose all their labor. But young men of your age are advanced enough to persevere and finish what they begin. And that's the end of my lecture."

"I am not a young man," said William. "I'm a boy."

"At any rate," rejoined Watt, "you are big enough to persevere and finish what you commence, and that comes to the same thing."

William now got down from the bench, and said he meant to begin his work im-

mediately. He took a small piece of smooth board, and with a lead-pencil made a list of the several stages into which he thought it best to divide the operation. He made nine in all, as follows: —

1. Drawing the plan.
2. Getting out the stuff.
3. Shaping and smoothing the pieces, ready to nail.
4. Nailing the box together.
5. Sawing off the part which was to form the cover, and putting on the hinges.
6. Getting out the pieces for the tray.
7. Nailing the tray together.
8. Painting the box.
9. Selecting and putting in the nails and screws.

"There," said he, when he had completed his list. "It will take me nine days to finish my box, if I do one portion of the work every day."

"You had better allow a fortnight, said Watt. "There will be some interruptions or delays. Always allow plenty of time for your jobs, and plenty of money for your journeys, — and then, if you have any time or money left over, so much the better."

"We can always allow time enough, I suppose," said William, "for our work, but not always money enough for a journey; for we may not have money enough."

"Then we can make the journey shorter," said Watt.

"Yes," replied William, "we *can* do that."

CHAPTER XVI.

THE NAIL-BOX.

There is one thing, perhaps, in the division which William made of his work into stages, that the reader may not understand, if he has never made a box of the kind which William was contriving, and that is the part relating to the sawing of the box in two, after it was made, to separate the portion which was to form the cover from that which was to become the body of the box.

The truth is that boys, when making such a box as this, often form the cover and the box part separately, instead of making them at first all in one. But this not only requires a great deal more work, but also involves special difficulty in making the top and bottom exactly alike, so that they shall fit well together. It is much better to make the cover and the body of the box

at first all in one, and then, drawing a pencil line all around in the proper place for the division, to saw the two portions apart.

This was what William intended to do.

The first stage of his work was, however as stated in the last chapter, to form his plan. To do this the first thing was to get together a collection of all the different kinds of nails, tacks, brads, and screws, that he wished to keep in his box.

Watt advised him not to include any very large sized nails, such as are used in making fences, and in nailing boards upon the frames of houses and barns, for he would very seldom wish to use nails of that size in any of his operations.

"Besides," said Watt, "those big nails take up a great deal of space, and the compartments for them would have to be so large that you would have very little room for the smaller kinds. Whereas it is the smaller kinds that you will have to use, chiefly, for your work."

William saw at once that this was good advice and so he left out all the large nails. The largest size that he included were

about an inch and a half long, — the kind called clapboard nails. The next size were about an inch long, and were of the kind called shingle nails.

Then he took two kinds of what are called *finishing* nails. These were of about the same length, respectively, with the clapboard and shingle nails, only the heads were different. The heads of finishing nails are small and narrow. They are so made in order that they may be driven into the wood a little way, by means of a punch, the cavity thus left being then filled up with putty. When the work is afterwards painted, the place seems smooth and even everywhere, with no signs of the places where the nails were driven.

The finishing work of rooms is always nailed in this way — the heads of the nails being all punched in, and puttied and painted over, so as to be entirely out of sight. If you examine the wood-work by the side of the doors or windows of any room, you will find it difficult to discover the places where the nails are, by which the work was nailed.

The reason why these nails are called

finishing nails is because they are used in this way by joiners, in all nice finishing.

What are called *brads* are quite similar to finishing nails, having very small and narrow heads, though the heads are of a somewhat different shape. Brads, too, are very slender, being meant for nailing boxes together and for other fine work. William had three sizes of brads. Some were an inch long; these are called inch brads. Then there were $\frac{3}{4}$ inch, and $\frac{1}{2}$ inch brads, which were the other two sizes.

Besides these he had two sizes of *tacks*. Tacks are exactly the opposite of brads in their form and mode of action. They are used chiefly for nailing down carpets and for upholstering furniture, and so they have large, flat heads, which spread as much as possible, so as to take a wide hold upon the cloth of the carpet, or upon the texture, whatever it is, that they are intended to fasten. They are different too in the form of that part which is to be driven into the wood. Brads are blunt at the end, and of uniform thickness throughout. For if they were sharp at the end the sides would have to *spread*, and this would give them a

wedge-like form, and they would be very apt to split the thin and narrow pieces of wood into which they often have to be driven. But being blunt at the end, and of the same thickness throughout, they do not wedge the wood apart when they are driven into it. But then it is necessary to bore a hole for them in the wood. The little borer which is used for this purpose is called a *brad-awl*, — that is, it is an awl used to bore holes for brads.

But tacks, on the other hand, being used to nail cloth and other such stuffs to solid masses of wood, like the boards of a floor, or the frames of great arm-chairs or sofas, are made sharp and wedge-like, so as to force their own way into the wood, without any boring, — for there is no danger of splitting such wood as that.

Watt explained all these things to William while he was getting together the different kinds of nails on the bench. William knew something of these differences before, and of the various purposes for which the various kinds were used. But he never understood the principles so well before, and he was very much interested in

examining minutely the different forms. He had the curiosity even to drive a carpet tack into a slender piece of wood, near the end of it, to see if it would split it. It did split it.

Boys very often try to nail small boxes together with carpet nails, but they almost always split the wood, while with brads, especially if a small hole is first made with a brad-awl, and the nail is put in right, that is, with the flat part parallel to the grain of the wood, there is no danger.

When William had got together in this way all the kinds of nails and screws which he intended to keep in his nail-box, he found it easy to determine how many compartments he would have. Watt advised him to have two or three more than he had things to put into then, so as to have some to spare for other things which he might require afterward, and William concluded to do so.

"And now," said William, "I must draw the plan of my compartments. I must draw *two* plans in fact, one for the bottom of the box, and one for the tray."

So he began to look about for a smooth

board large enough to draw the plans upon.

Watt helped him find a piece of board, and then taking a piece of wood with one edge straight, for a ruler, — or rather for a *straight edge*, as the carpenters call what they rule by, he began the work of drawing his plan. He first determined that he would make his box of the dimensions of fourteen inches by ten, and he proceeded to lay down lines of those lengths on his board, making the angles at the corners right angles by means of the square. When he had thus drawn the outline he proceeded to divide the space included within it into compartments, some large and some small, for the different sizes of the nails and screws. He arranged these compartments in a symmetrical manner, — the largest ones in the four corners, the next larger along the sides, and the smallest in the middle. He thought it would be easier to take out the small things from the small compartments near the middle of the box and of the tray, than if they were in the corners, or near the sides — while large things could be taken out there without any difficulty.

When William had finished drawing his two ground plans, as they are called, one of the bottom of the box, and one of the tray, — the several compartments being laid down according to scale, of the actual size that they were to have in the work, — he said, with a tone of satisfaction, —

"There! the first stage of my work is accomplished."

"Yes," said Watt, "and now the work must be put away."

William, however, was disposed to go on, and commence upon the second stage, namely, that of sawing out the pieces of wood of which the box was to be made.

"No," said Watt. "You have finished one stage of the work, and now you must rest upon it."

"But I am not tired at all," replied William.

"True," replied Watt. "That is just right. Leave off your work always, *before* you get tired, not *after* you get tired. It is when *you are getting tired* in doing such jobs that you do the mischief, so it is better to leave off in good season. Always leave off work with a surplus of strength, and supper with a surplus of appetite."

"Why supper more than breakfast or dinner?" asked William.

"It is better to leave off breakfast and dinner with a surplus of appetite," replied Watt, "but it is more important still for supper."

"Why is that?" asked William.

"Because if you eat too much just before you go to bed," replied Watt, "you will have bad dreams and perhaps wake up with the nightmare."

CHAPTER XVII.

CONCLUSION.

After this William went on very regularly with his nail-box until it was finished. By not attempting to forward his work more than one stage each day, or rather at each time of working, he was saved from the temptation of hurrying the work, and so performed every operation deliberately and carefully.

He met with some accidents, it is true. For example, after he had cut out the pieces for the top and bottom, and the sides, of his box, and had planed and smoothed them nicely, he found that one of them was unsound. There was a crack in it, at one end, and he was obliged to throw it aside, and cut out another in its place. Then, in nailing together the pieces which were to form the tray, he split one of them, in consequence of putting in the nail the wrong way.

He made one mistake too, in forming his plan, by reckoning the painting of the box as one operation. Whereas, to paint anything of that kind properly, requires three coats, each one of which requires one day at least to dry, before the next coat can be put on. So the painting of his box included three operations, to be performed on as many different days, instead of one, as he had calculated at the outset.

"The next thing that I make I can calculate better," said William.

"No," replied Watt, "you must not expect ever to calculate any better than you did this time. You have done very well indeed; as well as you can hope to do in undertaking any new thing Of course, if you were to attempt to make another nail-box, you could plan your work exactly, after this experience, but in undertaking new things, unforeseen difficulties must always be expected. All you can do is to make allowance for them, as we did in this case, by allowing a fortnight instead of simply nine days, for the work. The greatest engineers expect to meet with unforeseen difficulties in executing new works."

"What kind of difficulties?" asked William.

"Sometimes," replied Watt, "in making a tunnel, or a cut, through the mountains, they come upon very hard rock which dulls the drills so fast that it takes them twice as long to get through the work as they calculated: or they come upon a great spring of water that boils up out of the ground with so much force and abundance that it stops their operations entirely, until they can contrive some means to convey the water away.

"Sometimes," continued Watt, "in laying foundations, they come upon quicksands which give way so fast that the stones cannot be made to lie in their places without a great deal of trouble and delay. I once knew of a case in which they made an embankment for a railroad across a bog, and after it was all finished and they were preparing to lay the rails upon the track, they went out one morning to their work, and found that the whole embankment had sunk down into the bog, out of sight."

"And what did they do then?" asked William.

"They began again," said Watt, "and built up a new embankment over the old."

"And did that stay in its place?" asked William.

"It went on settling from time to time," replied Watt, "but as fast as it settled they carted in more earth, and finally they made it stand: though the first time they went over it with the locomotive they were rather afraid, and they went very carefully."

"Is the locomotive very heavy?" asked William.

"Yes," replied Watt, "enormously heavy."

"Heavier than a car full of passengers?" asked William.

"Yes," replied Watt, "a good many times as heavy. There are two reasons why a locomotive is so heavy. The first is because it must be made of iron, and the parts must be massive in order that they may be strong. The other reason is more important still. It must have great weight on the track in order that the wheels may *bite* the rails hard, and so be able to draw the load. If the locomotive

were light, the wheels would slip round, if the train was long and hard to pull, and so would not go ahead."

"Do you mean to be a railroad contractor, when you are a man?" asked Watt, after a moment's pause.

"I don't know," replied William. "I should like to be a railroad contractor if I had some good men to do the work."

"If you ever are a railroad contractor," said Watt, "when you undertake a job, and agree to have it done by a certain time, I advise you to take time enough, not only for the work and the difficulties that you can foresee, but also make ample allowance for those that you cannot foresee, so that you will be sure, even if accidents and delays do happen, that you will have the job completed according to contract."

"Yes," said William, "I will."